PACKAGE FOR TEACHER EDUCATORS
ON
INTERNET BASED LEARNING

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PREFACE

Education systems around the world are under pressure to use the digital technology to teach students the knowledge and skills they need in the 21st century With the emerging digital technologies, the teaching profession is evolving from teacher-centred, lecture-based instruction to student-centred interactive learning environments. In order to take full advantage of digital technology in teaching learning, it is essential that pre-service and in-service teachers should effectively use these new tools of learning Teacher education institutions and programmes must provide the leadership to the pre-service and in-service teachers in this direction

To accomplish this goal there is need of bringing about a change in the traditional views of the learning process and an understanding of how the digital technology can create new learning environments in which students are engaged learners, able to take greater responsibility for their own learning and construct their own knowledge. Now there is widespread concern that the educational experiences provided in many schools will not prepare students well for the future It is believed that creating a paradigm shift in views of the learning process, coupled with the application of digital technology, may play an important role in bringing educational systems into alignment with the emerging knowledge-based, information rich and technologically advanced society.

Technology has effectively revolutionized our society But teaching, and the world of education more generally have not taken the advantage of these changes We have largely failed to capitalize on the potential of new technologies, and particularly digital technology as a teaching tool. We have allowed our schools to remain in the past, while our children have been born in the future. The result is the mismatch between the learner and the educator. But it is not the children who are mismatched to the schools, the schools are mismatched to the children. Only by revising educational practice, we can close this gap, and reunite our schools with our children and the rest of our society. The theoretical foundation for such changes exists, and time to implement them is now

Internet technology has made a substantial contribution to education. The emphasis now continues to shift from Computer Based Learning (CBL) and its related methods such as Computer Assisted Instruction (CAI) to Internet Based Learning This new approach allows the learners to have more control over their own learning to think analytically and critically, and to work collaboratively. This constructivist approach is an effort at educational reform made easier by technology. In this process the learner has access to global rather than local software and maintain a direct link to the teacher This interactivity may take the form of a direct e-mail link, electronic conferencing or an automated connection to a server programme Internet Based Learning is founded upon constructivist pedagogy. As such learners are free and creative individuals who construct their own knowledge in a chosen content area through inquiry, exploration, information analysis, gathering and synthesizing.

In order to adjust effectively with the momentum of technological revolution, the learning system and those who manage them must prepare manpower to work with new technologies competently and confidently.

In view of the above here an attempt has been made to develop a package for teacher educator on Internet based teaching and learning

Hope this package will be useful for the Teacher Educators

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CHAPTER – I

THEORETICAL FRAMEWORK

1.0.0 INTRIDUCTION

Information and Communication Technologies (ICTs) have the potential to transform the nature of education- the role of the teacher, student, learning process and the curriculum Education systems around the world are under pressure to use the digital technology to teach students the knowledge and skills they need in the 21st century The 1998 UNESCO World Education Report, *Teacher and Teaching in a Changing World,* describes the radical implications the information and Communication Technologies (ICTs) have for conventional teaching and learning It predicts the transformation of teaching learning process and the way teachers and learners gain access to knowledge and information.

With the emerging digital technologies, the teaching profession is evolving from teacher-centred, lecture-based instruction to student-centred interactive learning environments. In order to take full advantage of digital technology in teaching learning, it is essential that pre-service and in-service teachers should effectively use these new tools of learning Teacher education institutions and programmes must provide the leadership to the pre-service and in-service teachers in this direction

To accomplish this goal requires both a change in the traditional views of the learning process and an understanding of how the digital technology can create new learning environments in which students are engaged learners, able to take greater responsibility for their own learning and constructing their own knowledge. Now there is widespread concern that the educational experiences provided in many schools will not prepare students well for the future. It is believed that creating a paradigm shift in views of the learning process, coupled with the application of digital technology, may play an important role in bringing educational systems into alignment with the emerging knowledge-based, information rich and technologically advanced society.

In view of this here an attempt has been made to examine the traditional view of the learning process, new paradigm of learning process, theories supporting the new view of learning process, a framework for digital technology in teacher education, instructional role of technology and integrating digital technology into constructivist learning environment.

1.1.0 Information And Communication Technologies And Teacher Education In A New Paradigm Of Learning

We are entering a world that is changing in all spheres. scientific and technological, political, economic, social, and cultural The emergence of the 'knowledge-based' society is changing the global economy and the status of education There is growing awareness among policy-makers, political leaders and educators that the educational system designed to prepare learners for an agrarian or industrially-based economy will not provide students with the knowledge and skills they will need to thrive in the 21st century's knowledge-based economy and society. The new knowledge-based global society is one in which.

- the world's knowledge base doubles every 2–3 years;
- 7,000 scientific and technical articles are published each day;
- data sent from satellites orbiting the earth transmit enough data to fill 19 million volumes every two weeks;
- graduates of secondary schools in industrialized nations have been exposed to more information than their grandparents were in a life-time;
- there will be as much change in the next three decades as there was in the last three centuries (National School Board Association, 2002)

The challenge confronting our educational systems is how to transform the curriculum and teaching-learning process to provide students with the skills to function effectively in this dynamic, information-rich, and continuously changing environment

The UNESCO Information and Communication Technologies in Teacher Education (2002) notes that the technology-based global economy also poses challenges to countries as national economies become more internationalized, with the increasing flow of information, technology, products, capital, and people between nations. This new economic environment is creating a new era of global competition for goods, services, and expertise All of these changes are producing dramatic shifts in the political, economic and social structures of many countries around the world In industrialized nations, the economic base is shifting from industry to information This shift also demands new knowledge and skills in the work force ICTs have changed the nature of work and the types of skills needed in most fields and professions While they have, on the one hand, created a wide array of new jobs, many of which did not even exist ten years ago, they have also replaced the need for many types of unskilled or low-skilled workers These trends pose new challenges to educational systems to prepare students with the knowledge and skills needed to thrive in a new and dynamic environment of continuous technological change and accelerating growth in knowledge production Education is at the confluence of powerful and rapidly shifting educational, technological and political forces that will shape the structure of educational systems across the globe for the remainder of this century. Many countries are engaged in a number of efforts to effect changes in the teaching/learning process to prepare students for an information and technology-based society.

The UNESCO World Education Report (1998) notes that the new technologies challenge traditional conceptions of both teaching and learning and, by reconfiguring how teachers and learners gain access to knowledge, have the potential to transform teaching and learning processes. ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centred and text-bound classrooms into rich, student-focused, interactive knowledge environments To meet these challenges, schools must embrace the new technologies and appropriate the new ICT tools for learning They must also move toward the goal of transforming the traditional paradigm of learning

1.1.1 The traditional view of the learning process

The existing view of the learning process emerged out of the factory model of education at the turn of the 20th century and was highly effective in preparing large numbers of individuals with skills needed for low-skilled positions in industry and agriculture. The innovation of classrooms with 20-30 students was created along with the concept of standardized instruction for everyone, where the teacher serves as the repository and transmitter of knowledge to the students. The UNESCO Information and Communication Technologies in Teacher Education (2002) notes that the traditional educational paradigm is often characterized by the following views of learning

Learning is hard Many view learning as a difficult and often tedious process. According to this view, if students are having fun or enjoying what they are doing in a learning activity, they probably are not learning.

Learning is based on a deficit model of the student. The system strives to identify deficiencies and weaknesses of the student. Based on noted deficiencies, students are tracked, categorized, remediated or failed. The impact of the deficit model of student learning is most obvious in compensatory education programmes Bruer, in his book, *Schools for Thought*, notes that research overwhelmingly concentrates on the weaknesses of poor children Very little research has been done on their strengths. In addition, the weaknesses identified are often deficiencies in terms of the traditional organization and content of schooling. Very little thought has been given to the idea of changing schooling to accommodate new kinds of students; all the effort has gone to changing the students so that they will fit into the schools In addition, the underlying assumptions about poor students' motivation, language, and conceptual development have "militated against offering them a literacy of thoughtfulness and have favoured a low-level, atomized, concrete, basic-skills curriculum. The language of that curriculum has been so simplified that it is both boring and artificial It has been stripped of its richness and context and made fundamentally meaningless, which is to say unabsorbable by normal people, except through memorization, whose effects last only a few hours or days " (Bruer, 1993)

Learning is a process of information transfer and reception Much of our present learning enterprise remains "information-oriented," emphasizing students *reproducing knowledge* rather than *producing their own knowledge* It also remains teacher-centred Many still see the role of the teacher as a dispenser of information and the role of the student as a passive receiver, storer and repeater of the transmitted information. The prevalence of this view is supported by observations that teachers continue to rely on old standbys such as lectures, textbook reading, and fill-in-the-worksheets practices that reduce students to passive recipients of information and fail to develop their thinking skills

Learning is an individual/solitary process In a study of schools in the United States, the National Assessment of Educational Progress noted that most students spend long hours working alone at their desks completing worksheets or repetitive tasks. A London Times survey of English school children indicated that students almost unanimously rejected this daily ordeal of dull and ritualistically solitary classroom activity and called for a broader and more exciting curriculum. Above all, they wanted more work allowing them to *think for themselves* They wanted to design and make things, to experiment and to engage in first-hand observation The Times reported, however, that there was little evidence of changes in the curriculum that would respond to the students' wishes (Resta, 1996)

Learning is facilitated by breaking content/instruction into small isolated units The educational system is often geared more to categorizing and analyzing patches of knowledge than to sewing them together Bruer (1993) notes that the technology of mass education is quite adept at "breaking knowledge and skills into thousands of little standardized, decontextualized pieces, which could be taught and tested one at a time" Neil Postman in his book, *Teaching as a Subversive Activity*, states that our educational systems break knowledge and experience into "subjects, relentlessly turning wholes into parts, history into events without restoring continuity" (Postman, 1969)

Learning is a linear process. Frequently, the textbook or teacher provides only one linear path through a narrowly bounded content area or sequence of standardized instructional units. For example, in a mathematics text only one correct problem solution trail may be offered for a specific subclass of problems. However, the problems encountered in daily life (or in mathematics) seldom have only one solution path or sequence.

1.1.2 New paradigm of the learning process

The UNESCO Information and Communication Technologies in Teacher Education (2002) notes that in contrast to the traditional teaching-learning paradigm, a new paradigm of the teaching-learning process is emerging, based on three decades of research in human learning, that encompasses the following views of the human learning process.

Learning is a natural process The natural state of the brain is to learn, however, not everyone learns in the same way There are different learning, perceptual and personality styles that must be considered in the design of learning experiences for the individual student. Given interesting and rich learning environments, and supportive and stimulating teachers, students will learn Teachers have often noted that children who appear disruptive or to have short attention spans when confronted with typical classroom instruction, may spend long periods engaged in meaningful and interesting computer-related activities

Learning is a social process. The communal context of knowledge and learning is beginning to be rediscovered, as evidenced by the rapid growth of quality circles and computer-supported collaborative work in business, government, medicine, and higher education As Vygotsky (1978) noted long ago, students learn best in collaboration with peers, teachers, parents, and others when they are actively engaged in meaningful, interesting tasks ICTs provide opportunities for teachers and students to collaborate with others across the country and across the globe They also provide new tools to support this collaborative learning in the classroom and online.

Learning is an active and not a passive process In most fields, people are faced with the challenge of *producing knowledge* rather than simply *reproducing knowledge* To allow students to move toward competence, they must be actively engaged in the learning process, in activities such as solving real problems, producing original writing, completing scientific research projects (rather than simply studying about science), dialoguing with others on important issues, providing artistic and musical performances, and constructing physical objects The traditional curriculum asks students only to recall and describe what others have accomplished or produced. While all production of knowledge must be based on an understanding of prior knowledge, the mere reproduction of knowledge, without its connection to the production of knowledge, is largely a passive activity that neither fully engages nor challenges the student

Learning may either be linear or non-linear Much of what now happens in schools appears based on the notion that the mind works like a serial processor that is designed to process only one piece of information at a time in sequential order. But the mind is a wonderful parallel processor that may attend to and process many different types of information simultaneously. Cognitive theory and research sees learning as a reorganization of knowledge structures The knowledge structures are stored in semantic memory as schema or cognitive maps. Students "learn" by augmenting, combining, and rearranging a collection of cognitive maps, many of which overlap or are interconnected through a complex network of associations. There are many ways that students may acquire and process information and assimilate it into their existing knowledge structures Although some knowledge domains, such as mathematics, may perhaps lend themselves to a linear approach, not all learning can or should occur linearly

Learning is integrative and contextualized. Pribram's holistic brain theory suggests that information presented globally is more easily assimilated than information presented only in a sequence of information elements (Pribram, 1991) It is also easier for students to see relations and to make connections. Jacob Bronowski (1990), in *Science and Human Values*, made the point that to discover the connection between what had seemed two isolated facts of existence is a creative act, whether the field is art or science. He calls it an act of unifying This is not something that can be done for learners, these connections cannot be made in learners' minds. information can be given, the connection can even be stated But even if the information is repeated, it cannot be assumed it is really known. The learners must discover it for themselves That is not to say that learners must discover everything unaided The teacher's role is to help them in several ways to make connections and to integrate knowledge.

Learning is based on a strength model of student abilities, interest, and culture. Based on the work of Howard Gardner and others, schools are beginning to consider the specific strengths and interests that students bring to the learning environment, and are designing learning activities that build on student strengths rather than focusing only upon remediating weaknesses. In addition, schools increasingly recognize diversity as a resource rather than a problem in the classroom In contrast to the remedial and standardized concept of instruction, diversity and individual differences are valued and the learning process is designed to build on the strengths and assets brought by the learner to the classroom.

Learning is assessed through task completion, products, and real problem solving of both individual and group efforts. Rather than simply evaluating students through paper and pencil tests, assessments are made using portfolios of actual performances and work in both collaborative and individual learning tasks The traditional view of the learning process is typically teacher-centred, with teachers doing most of the talking and intellectual work, while students are passive receptacles of the information provided. This is not to indicate that the traditional lecture method is without value, as it allows the teacher to quickly convey lots of information to students and is a useful strategy for recall or rote learning However, it is not the most effective way to help students develop and use higher order cognitive skills to solve complex real world problems. As noted by Driscoll (1994), we no longer can view learners as "empty vessels waiting to be filled, but rather as active organisms seeking meaning." Don Tapscott, in his book *Growing Up Digital: The Rise of the Net Generation* (1998), notes that we are entering a new era of digital learning in which we are in the process of transitioning from "broadcast" learning to "interactive" learning Today's students no longer want to be passive recipients in the information transfer model of learning. Rather they want to be active participants in the learning process There is growing recognition that today's world requires that students be able to work collaboratively with others, think critically and creatively, and reflect on their own learning processes.

1.1.3 A paradigm shift: from teaching to learning

As technology has created change in all aspects of society, it is also changing our expectations of what students must learn in order to function in the new world economy. Students will have to learn to navigate through large amounts of information, to analyze and make decisions, and to master new knowledge domains in an increasingly technological society. They will need to be lifelong learners, collaborating with others in accomplishing complex tasks, and effectively using different systems for representing and communicating knowledge to others. A shift from teacher-centred instruction to learner-centred instruction is needed to enable students to acquire the new 21st century knowledge and skills. The following table (Sandholtz, Ringstaff, and Dwyer, 1997) identifies the shift that will take place in changing from a focus on teaching to a focus on learning.

Table 1 1 Teacher-Centred and Learner-Centred Learning Environments

	Teacher Centred learning environments	**Learner centred learning environment**
Classroom activity	Teacher-centred, Didactic	Learner-centred, Interactive
Teacher role	Fact teller, Always expert	Collaborator, Sometimes learner
Instructional emphasis	Facts' memorization	Relationships, Inquiry and invention
Concepts of knowledge	Accumulation of facts, Quantity	Transformation of facts

Demonstration of success	Norm referenced	Quality of understanding
Assessment	Multiple choice items	Criterion referenced, Portfolios and performances
Technology use	Drill and practice	Communication, access, collaboration, expression

Shifting the emphasis from teaching to learning can create a more interactive and engaging learning environment for teachers and learners This new environment also involves a change in the roles of both teachers and students As shown in Table 1 2 (adapted from Newby et al , 2000), the role of the teacher will change from knowledge transmitter to that of learning facilitator, knowledge guide, knowledge navigator and co-learner with the student The new role does not diminish the importance of the teacher but requires new knowledge and skills Students will have greater responsibility for their own learning in this environment as they seek out, find, synthesize, and share their knowledge with others. ICTs provide powerful tools to support the shift to student-centred learning and the new roles of teachers and students

Table 1 2 Changes in Student and Teacher Roles in Learner-Centred Environments

A shift from:	***A shift to:***
Knowledge transmitter, primary source of information, content expert, and source of all answers	Learning facilitator, collaborator, coach, mentor, knowledge navigator, and co-learner

Teacher controls and directs all aspects of learning	Teacher gives students more options and responsibilities for their own learning
Changes in Student Role	
A shift from:	***A shift to:***
Passive recipient of information	Active participant in the learning process
Reproducing knowledge	Producing and sharing knowledge, participating at times as expert
Learning as a solitary activity	Learning collaboratively with others

(Table adapted from one developed by Newby et al., 2000).

1.1.4 Theories supporting the new view of the learning process

The new views of the learning process and the shift to student-centred learning have emerged based on cognitive learning research and the confluence of several theories that have informed our understanding of the nature and context of learning. Some of the most prominent theories include. sociocultural theory (based on Vygotsky's intersubjectiveness and Zone of Proximal Development), constructivism, self-regulated learning, situated cognition, cognitive apprenticeship, problem-based learning (Cognition and Technology Group at Vanderbilt), cognitive flexibility theory (Spiro et al, 1988), and distributed cognition (Salomon et al, 1993). Each of these theories is based on the same underlying assumptions that learners are active agents, purposefully seeking and constructing knowledge within a meaningful context.

In student-centred environment the learner interacts with other students, the teacher, information resources, and technology The learner engages in authentic tasks in authentic contexts using authentic tools and is assessed through authentic performance. The environment provides the learner with coaching and scaffolding in developing knowledge and skills. It provides a rich collaborative environment enabling the learner to consider diverse and multiple perspectives to address issues and solve problems It also provides opportunities for the student to reflect on his or her learning

Although the new learning environment can be created without the use of technology, it is clear that ICTs can provide powerful tools to help learners access vast knowledge resources, collaborate with others, consult with experts, share knowledge, and solve complex problems using cognitive tools ICTs also provide learners with powerful new tools to represent their knowledge with text, images, graphics, and video.

The new view of the learning process is based on research that has emerged from theoretical frameworks related to human learning. Many reflect a constructivist view of the learning process. In this view, learners are active agents who engage in their own knowledge construction by integrating new information into their schema or mental structures The learning process is seen as a process of "meaning-making" in socially, culturally, historically, and politically situated contexts. In a constructivist learning environment, students construct their own knowledge by testing ideas and approaches based on their prior knowledge and experience, applying these to new tasks, contexts and situations, and integrating the new knowledge gained with pre-existing intellectual constructs.

A constructivist environment involves developing learning communities comprised of students, teachers and experts who are engaged in authentic tasks in authentic contexts closely related to work done in the real world. A constructivist learning environment also provides opportunities for learners to experience multiple perspectives. Through discussion or debate, learners are able to see issues and problems from different points of view, to negotiate meaning, and develop shared understandings with others The constructivist learning environment also emphasizes authentic assessment of learning rather than the traditional paper/pencil test. Some of the most influential theories that relate to new views of the learning process include:

Vygotsky's Sociocultural Theory

Vygotsky's sociocultural theory of human learning describes learning as a social process and the origination of human intelligence in society or culture The major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition. Vygotsky believed every thing is learned on two levels First, through interaction with others, and then integrated into the individual's mental structure.

> Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological) This applies equally to voluntary attention, to logical memory, and to the formation of concepts All the higher functions originate as actual relationships between individuals. (Vygotsky, 1978, p 57)

A second aspect of Vygotsky's theory is the idea that the potential for cognitive development is limited to a "zone of proximal development" (ZPD). This "zone" is the area of exploration for which the student is cognitively prepared, but requires help and social interaction to fully develop (Briner, 1999). A teacher or more experienced peer is able to provide the learner with "scaffolding" to support the student's evolving understanding of knowledge domains or development of complex skills. Collaborative learning, discourse, modelling, and scaffolding are strategies for supporting the intellectual knowledge and skills of learners and facilitating intentional learning The implications of Vygotsky theory are that learners should be provided with socially rich environments in which to explore knowledge domains with their fellow students, teachers and outside experts ICTs can be used to support the learning environment by providing tools for discourse, discussions, collaborative writing, and problem-solving, and by providing online support systems to scaffold students' evolving understanding and cognitive growth

Jean Piaget 's theory of cognitive development

Based on his research on the development of children's cognitive functions, Piaget's work is regarded by many as the founding principles of constructivist theory He observed that learning occurs through adaptation to interactions with the environment. Disequilibrium (mental conflict which demands resolution) gives rise to Assimilation of a new experience, which is added to the existing knowledge of the learner, or to Accommodation, which is modification of existing understanding to provide for the new experience Specifically, Piaget posited that the existing cognitive structures of the learner determine how new information is perceived and processed If the new information makes sense to the existing mental structure of the learner, then the new information item is incorporated into the structure (i e., Assimilation) If, however, the data are very different from the existing mental structure of the learner, they are either rejected or transformed in ways so that it fits into the structure (i.e , Accommodation) The learner has an active role in constructing his or her own knowledge in both of these ideas. He observed that, as children assimilated new information into their existing mental structures, their ideas gained complexity and power, and their understanding of the world grew in richness and depth These ideas are core concepts of the constructivism view of thelearning process (Jean Piaget Society, 2001)

Jerome Bruner's learning theory

Similar to Piaget, Bruner emphasized that learning is an active process in which learners construct new ideas or concepts based upon their prior knowledge and experience. He identified three principles to guide the development of instruction. These include: (1) instruction must be concerned with the experiences and contexts that make the student willing and able to learn (readiness); (2) instruction must be structured so that the student can easily grasp it (spiral organization), and, (3) instruction should be designed to facilitate extrapolation and/or fill in the gaps (going beyond the information given)

Problem-Based Learning

The goals of problem-based learning (PBL) are to develop higher order thinking skills by providing students with authentic and complex problems and cases. This approach to learning provides a more authentic context for learning and engages students in authentic tasks. It is used frequently in fields such as engineering, medicine and architecture. Through the process of working together, articulating theories, creating hypotheses, and critically discussing the ideas of others, students move to deeper levels of understanding of the problem The self-directed learning strategies developed in PBL may help foster students' lifelong learning.

Anchored Instruction

Anchored instruction is an approach to designing instruction that is 'anchored' in a real world context, problem or situation. Technology has been used to help create 'real world' contexts and situations through the use of video. The video segments provide the context for the subsequent learning and instruction. (Bransford & Stein, 1993)

Distributed Cognition

Distributed cognition emphasizes that cognitive growth is fostered through interaction with others and involves dialogue and discourse, making private knowledge public and developing shared understandings. Tools for online collaboration have been designed to support collaborative knowledge construction and sharing in the classroom (Oshima, Bereiter, and Scardamalia, 1995)

Cognitive Flexibility Theory

This theory asserts that people acquire knowledge in ill-structured domains by constructing multiple representations and linkages among knowledge units It also notes that learners revisit the same concepts and principles in a variety of contexts. The theory is useful in understanding how knowledge is transferred in ill-structured knowledge domains (Spiro et al , 1988)

Cognitive Apprenticeship

Cognitive apprenticeship is a term for the instructional process in which teachers or more experienced or knowledgeable peers provide 'scaffolds' to support learners' cognitive growth and development. Cognitive apprenticeship permits students to learn through their interactions, construct knowledge, and share knowledge-building experiences with the other members of the learning community ICTs provide powerful new tools to support cognitive apprenticeships, enabling groups to share online workspaces to collaboratively develop artifacts and intellectual products They also make possible tele-apprenticeships, in which an expert is able to work with or mentor a student who may be thousands of miles distant.

Situated Learning

Situated learning emphasizes the use of apprenticeship, coaching, collaboration, authentic contexts, tasks, activities and cognitive tools (Brown, Collins & Duguid, 1989). It occurs when students work on authentic tasks that take place in real-world settings (Winn, 1993) Learning is viewed as a function of the activity, context and culture in which it occurs, which contrasts with most classroom learning which is abstract and out of context (Lave, 1988). Situated cognition theory emphasizes providing an authentic context for the learner and encouraging social interaction and collaboration in the learning environment Through collaborative problem solving, dialogue, and discussion students are able to develop deeper levels of understanding of a problem or knowledge domain.

Self-Regulated Learning

Self-regulated learners are those who are aware of their own knowledge and understandings, i e , what they know and what they do not know or need to understand. It combines self-observation, self-judgment, and self-reaction Self-regulation plays a crucial role in all phases of learning and has the potential to increase the meaningfulness of students' classroom learning (Schoenfeld, 1987). ICT tools can be used to make students' tacit knowledge public and to help them develop metacognitive skills and become more reflective and self-regulated learners (Hsiao, 1999).

These theories that undergird the new views of the learning process help shape the new pedagogies for learning. Ultimately, the power of ICTs will be determined by the ability of teachers to use the new tools for learning to create rich, new, and engaging learning environments for their students. The UNESCO World Education Report (1998) notes that: The challenge for ICTs in Teacher Education is to assure that the new generation of teachers, as well as current teachers, are well prepared to use new learning methods, processes and materials with the new ICT tools for learning

1.2.0 A Framework for Information and Communication Technologies (ICTs) in Teacher Education

In planning for the infusion of ICTs into teacher preparation programmes, several factors important to a programme's success must be considered The UNESCO Information and Communication Technologies in Teacher Education (2002) provides a holistic framework to assist in designing the integration of information and communication technologies (ICTs) into teacher education The framework is coherent with the context provided by today's society and reflects more recent understandings of the nature of learning, including aspects of learning communities during the school years and beyond into life-long learning The holistic framework will help teacher educators and administrators consider the cultural and educational system context, technology resources, and other factors that are important in planning the integration of technology into the pre-service curriculum. Limited technology resources and conditions of rapid change in educational, economic and political systems challenge many contexts of this curriculum. Information and communication technologies have been broadly defined as 'interactive radio' and multiple media including TV, as well as computers and hand-held electronic devices The framework was designed by representatives of international projects to assist policy makers, course developers, teacher educators, and other professionals who are charged with developing the use of information and communication technologies (ICTs) in teacher education programmes. The model will help assure that national and local infrastructure, culture and context, among other factors, will be considered in designing new curricula, and that curricula will be kept up to date, as new developments are forged in education

Figure 2 1 shows the curriculum framework is comprised of four clusters of competencies encircled by four supportive themes. The curriculum framework also suggests that each teacher is allowed to interpret the framework within his or her context and personal approach to pedagogy, which is always related to the subject discipline or content area, rather than to the technology itself. The four themes that bind the curriculum as a whole are described briefly below, followed by descriptions of the four core competencies Finally, the core curriculum is illustrated with a hypothetical example that demonstrates how the framework may be applied to a specific situation

Four Themes

Context and Culture identifies the culture and other contextual factors that must be considered in infusing technology into teacher education curriculum. It includes the use of technology in culturally appropriate ways and the development of respect for multiple cultures and contexts, which need to be taught and modelled by teachers *Leadership and Vision* are essential for the successful planning and implementation of technology into teacher education and require both leadership and support from the administration of the teacher education institution *Lifelong Learning* acknowledges that learning does not stop after school.

In common with the other themes, it is important that teachers and teacher preparation faculty model lifelong learning as a key part of implementation, and as an ongoing commitment to ICTs in teacher education *Planning and Management of Change* is the final theme, born of today's context and accelerated by technology itself. It signifies the importance of careful planning and effective management of the change process. These themes may be understood as a strategic combination of approaches that help teacher educators develop the four core competencies The core competencies may be seen as clusters of objectives that are critical for successful use of ICTs as tools for learning

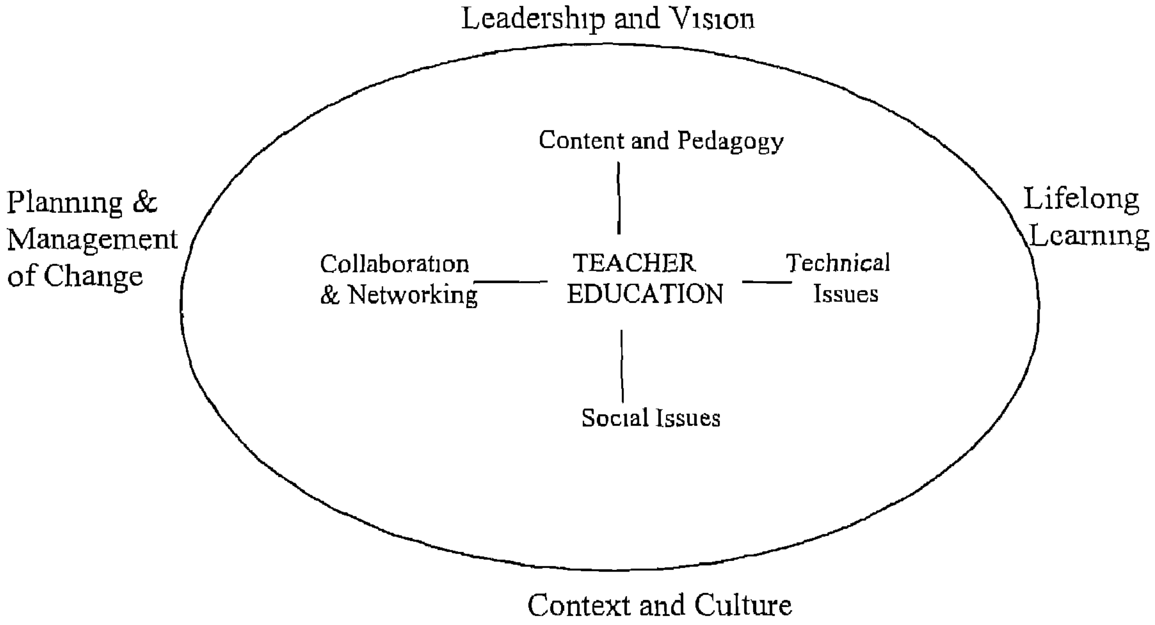


Figure 2.1 A Framework for ICTs in Teacher Education

Four Competencies

The ICT competencies are organized into four groups. *Pedagogy* is focused on teachers' instructional practices and knowledge of the curriculum and requires that they develop applications within their disciplines that make effective use of ICTs to support and extend teaching and learning *Collaboration and Networking* acknowledges that the communicative potential of ICTs to extend learning beyond the classroom walls and the implications for teachers development of new knowledge and skills technology brings with it new rights and responsibilities, including equitable access to technology resources, care for individual health, and respect for intellectual property included within the *Social Issues* aspect of ICT competence. Finally, *Technical Issues* is an aspect of the Lifelong Learning theme through which teachers update skills with hardware and software as new generations of technology emerge As a final reminder of the holistic nature of this curriculum, the model illustrates the interdependence of the themes and competencies – all themes interacting with all competencies. The following is a description of the four competencies.

Pedagogy

The most important aspect of infusing technology in the curriculum is pedagogy. When implementing the pedagogical competencies for infusing technology, the local context and the individual approach of the teacher linked with that of their subject discipline must be paramount. Teachers move through stages as they adopt ICTs Initially, the teacher adopting technology applies it simply as a substitute for current teaching practice where technology is not used (e.g., teacher lecture becomes electronic presentation supporting lecture, students writing papers by hand become students writing papers using a word processor, course syllabus on paper becomes course syllabus online) The adaptation of ICTs by teachers should (and does) challenge and support changes in teaching practice, building upon individual pedagogic expertise. As teachers' pedagogical practices with new technologies continue to develop, and organizational support and access to ICTs grow, it becomes possible to move beyond the adaptation of ICT applications that fit with existing practice. Transformation of the educational process will start to emerge and may move toward more student-centred learning environments as shown in Figure 1.2

In summary, as professional teachers educators continually develop their pedagogical use of ICTs to support learning, teaching, and curriculum development, including assessment of learners and the evaluation of teaching, they will

- demonstrate understanding of the opportunities and implications of the uses of ICTs for learning and teaching in the curriculum context,
- plan, implement, and manage learning and teaching in open and flexible learning environments,
- assess and evaluate learning and teaching in open and flexible learning environments

Collaboration and Networking

ICTs provide powerful new tools to support communication between learning groups and beyond classrooms The teacher's role expands to that of a facilitator of collaboration and networking with local and global communities. The expansion of the learning community beyond the classroom also requires respect for diversity, including inter-cultural education, and equitable access to electronic learning resources There is growing evidence that communities learn through collaborative activities that reflect diverse cultures in authentic projects that serve society Both local and global understandings can be enhanced using ICTs, as illustrated in the fictional example of School X later in this section The development of teachers' competencies in networking and collaboration are therefore essential to ICTs in education Through collaboration and networking, professional teachers promote democratic learning within the classroom and draw upon expertise both locally and globally In this process, they will·

- demonstrate a critical understanding of the added value of learning networks and collaboration within and between communities and countries;
- participate effectively in open and flexible learning environments as a learner and as a teacher,
- create or develop learning networks that bring added value to the education profession and society (locally and globally); and

- widen access and provide learning opportunities to all diverse members of the community, including those with special needs

Social and Health Issues

The power to access information and communication technologies brings increased responsibilities for everyone. Legal and moral codes need to be extended to respect the intellectual property of freely accessible information. Copyright applies to web resources, too, regardless of the ability of the user to purchase the rights This respect can be modelled in classroom practice with students from an early stage The challenges faced by society , locally and globally, by adoption of technology should become part of the curriculum in a way that involves learners and helps them to develop an effective voice in the debates Health issues of ICTs also need to be addressed For example, prolonged engagement with ICTs (including screens and keyboards) requires appropriate support for the body, especially the hands and back. Similarly, hazards of electricity and other power sources require care and the modeling of safe practice. The technology standards for students and teachers from the International Society for technology in Education (ISTE) offer guidelines for social issues, under the topic of social, ethical, legal, and human guidelines relating to the responsible use of technology The ISTE standards may be found at http //cnets.iste org/

In summary, professional teachers need to understand social and health issues surrounding ICTs and apply that understanding in their practice. Specifically, they need to:

- understand and apply the legal and moral codes of practice, including copyright and respect for intellectual property,
- reflect upon and lead discussion of the impact of new technology on society, locally and globally, and

- plan and promote healthy use of ICTs, including seating, light, sound, and related energy sources (including electricity and radio signals)

Technical Issues

Technical issues regarding integration of ICTs into the curriculum include the technical competencies and provision of both technical infrastructure and technical support for technology use throughout the curriculum. Technical competencies of the individual are perhaps the most obvious but perhaps the least important in the long-term because use of technology should ultimately become transparent When technology is robust and used competently, it moves from the foreground to the background and remains essential. This is similar to the process of gaining any new skillset, such as riding a bicycle Each new skill must be consciously attended to and practiced until it becomes an automatic response Competent bike riders do not focus on balance and the pedals of the bike, they focus on navigation and safety However, we do recognize that in many contexts, the lack of technology competence, infrastructure, and technical support can create barriers to access and reliability resulting in diminished support for the curriculum Additional technical support or training is therefore advised, depending on local circumstances

Simply providing the technology for learners and teachers is not enough The type and level of access is also important. ICTs will improve learning very little if teachers and students have only rare and occasional access to the tools for learning. Reasonable access to ICTs has been shown to be important for the acquisition of competence with hardware and software, especially for teachers. For example, provision of portable computers is an important strategy for ICTs teacher education. Teachers with portable computers can use them for both teaching in school and for other professional activities elsewhere.

1.3.1 Learning from the technology

When technology is used to convey specific information or skills, Zucchermaglia (1991) describes it as "full" technology--full of information to be conveyed to the student Maddux, Johnson, and Willis (1997) label applications that support this use as Type I applications, which are "designed to make it easier, quicker, or otherwise more efficient to continue teaching the same things in the same ways we have always taught them" (p. 18). Use of technology in this case mirrors traditional classroom practice· users are relatively passive, the content and interaction between the user and the software are predetermined, and there is a limited repertoire of acceptable responses The acquisition of facts through repeated practice and rote memory, or learning from the technology (Jonassen, 1996), is the goal of instruction This use of technology was the most prevalent one in the 1970s and 1980s (Jonassen, 1996)

"Full" or Type I technologies include computer assisted instruction, integrated learning systems, computer-based tutoring systems, assessment software, and administrative software, such as electronic grade books or attendance record-keeping software Computer-assisted instruction and integrated learning systems have been readily adopted in many schools as they closely match the traditional routine of classroom life. McClintock (1992) points out that technology has often been used as a replacement for existing tools, such as books, rather than as an alternative medium through which different tasks might be performed and different objectives might be achieved. Some researchers (Vockell and Schwartz, 1992; Merrill, Tolman, Christensen, Hammons, Vincent, and Reynolds, 1986) suggest that computer-assisted instruction can increase achievement because it leads to automaticity of lower-level skills through extended practice A computer that is endlessly patient with the learner monitors this practice. In the tutorial form of computer-assisted instruction, the computer provides additional information to the learner if an incorrect answer is supplied. This continues until the learner is successful

Hundreds of research studies have been conducted regarding the effects of computer-assisted instruction (CAI) From his analysis of twelve meta-analyses of the effectiveness of computer-based instruction programs developed primarily prior to 1990, Kulik (1994) concludes that students usually learn more and in less time with computer-based instruction Becker (1992), however, found numerous methodological problems with many studies that have demonstrated positive effects of using CAI In his meta-analysis of 100 studies, he concludes that differences in CAI users and non-users are too small to have educational significance.

1.3.2 Learning about the technology

Another use of technology in schools that exemplifies traditional learning environments includes learning about the technology itself (Jonassen, 1996) Classes in computer programming and computer literacy are designed to teach students how computers work. Students learn specific skills related to using the computer, such as keyboarding skills, ethical uses of computers, or a particular programming language, but these skills are not tied to other content. These classes were prevalent in the 1980s, but Jonassen (1996) observes that this use of technology is now less emphasized in schools He attributes the change to

- the increasing availability of computers in society that gives students more experience with them outside of schools;
- the understanding that one does not have to know how a computer works to take advantage of it as a tool, and the
- emphasis on memorizing vocabulary about computers in computer literacy classes, which had little applicability to educational goals of schools.

1.3.3 Learning with the technology

Learning with technology drives much of the current thinking about the use of technology to support learning (Jonassen, 1996). Bonk, Hay, and Fischler (1996) note, "Currently popular ideas about students using electronic tools to be designers of knowledge are akin to Dewey's arguments that children must actively construct and interrelate knowledge by learning in more authentic ways" (p. 95). According to this perspective, when technology becomes an integral part of the classroom learning environment it provides a tool for both teachers and students that can facilitate new roles and new instructional strategies

Technology used as a tool can serve as a means to seek and process information, and to reflect on one's understandings, beliefs, and thinking processes Used in this way, technology is "empty" as it allows the learner to enter information and explore new content relationships (Zucchermaglia, 1991). Ordinary application software such as word processing, spreadsheet, graphics, presentation, and database software, problem-solving software, simulations, electronic mail; and the Internet are technology tools that fit into this category These applications, labeled Type II by Maddux et al. (1997), give the user control of almost everything that happens, including the interaction between the user and the machine. An extensive repertoire of acceptable responses is provided for. Rather than rote memorization of facts, Type II applications encourage the accomplishment of creative, higher-level tasks (Maddux et al , 1997).

Because of the interactive nature of technology and the power of its information-processing capabilities, Jonassen (1996) proposes that when students learn with technology, it becomes a "mindtool " He defines mindtools as "computer-based tools and learning environments that have been adapted or developed to function as intellectual partners with the learner in order to engage and facilitate critical thinking and higher-order learning" (p. 9) Using commonly available software (databases, spreadsheets, electronic mail, multimedia, hypermedia, and others), learners employ technology to both construct and represent knowledge

1.3.4 Technology and the Instructional Implications of Constructivism

The literature suggests that technology can support constructivist learning environments when technology is used as a tool for learning, rather than the object of instruction or as the instructor, it can assist the teacher to uncover students' prior knowledge, understanding and beliefs, base instruction on the posing of problems; increase the complexity of the context; take on the role of the facilitator; increase the ability of students to test multiple scenarios and thus challenge preconceived notions and misconceptions: and, broaden the circle of social interaction to include students' peers and experts beyond the classroom, the school, the community and even their own country

Constructivism transforms the student from a passive recipient of information to an active participant in the learning process Always guided by the teacher, students construct their knowledge actively rather than just mechanically acquiring knowledge from the teacher or the textbook Students become engaged by applying their existing knowledge and real-world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings Its primary goal is helping students learn *how to learn*.

In a constructivist learning environment technology plays an acknowledged and purposeful role in the day-to-day activities, but does not become the object of instruction (McClintock, 1992) According to its advocates, this environment can provide students with a complex laboratory in which they can observe, question, practice, and validate knowledge The following discussion examines how technology can be used to support the creation of classroom environments based on the instructional implications of constructivist learning theory. This discussion is based on the premise that it is learning with, not from or about, technology that makes computer-based technologies important tools in a constructivist learning environment

Instructional approaches

Constructivist learning theory suggests that teachers must understand what learners bring to the learning situation and begin there in helping students build new knowledge. Basic, Type II applications offer tools to help with this process. For example, students can use word-processing software or e-mail to share their understandings with student peers as well as teachers. These uses of technology have been demonstrated to improve writing skills, produce more and better ideas for decision making, and increase motivation (Center for Applied Special Technology, 1996; Chun, 1994; Cohen and Riel, 1989, Honey and Henriquez, 1996, Mabrito, 1992, Moore and Karabenick, 1992; Naiman, 1988; Olaniran, 1994).

Technology can help to make students' thinking processes more visible to the teacher, something that does not happen when students simply turn in a completed assignment for checking and grading. As teachers observe their students working with computer applications, they can see the choices each student is making, stop and ask about the student's goals, and make suggestions for revisions or different strategies (Means and Olson 1997, p. 126-127).

One technology particularly suited to this process is Computer Supported Intentional Learning Environments (CSILE), developed by researchers at the Centre for Applied Cognitive Science (Ontario Institute for Studies in Education). CSILE is a software-based tool that provides a means for students to build a collective database (knowledge-base) of their thoughts, in the form of pictures and written notes. CSILE stores the thoughts entered by each student and makes them available for everyone, The system is a form of hypermedia that allows notes entered as text, drawings, graphs, and timelines to be retrieved, linked, commented on, rated, and so forth (Scardamalia, Bereiter, McLean, Swallow, and Woodruff, 1989, p 52)

Students enter what they already know about a topic at the beginning of the creation of a CSILE database This provides a tool for the teacher both to identify prior knowledge and to document the process of knowledge construction. Using CSILE, students can create and label written notes in a variety of ways The labels are encouraged "in order to facilitate reflection and to allow the notes to reappear in multiple contexts In addition, written notes can be placed on a timeline, or attached to a spot on a picture" (Scardamalia et al., 1989, p. 52)

Knowledge mapping software is designed to capture and organize brainstorming and idea generation sessions into concept or knowledge webs. This is a useful technology to help teachers uncover students' existing knowledge about a topic For example, the teacher can pose a problem or suggest a content topic to students Using the software, students can create a diagram of ideas, consisting of one or a few words, connected by "links," which may be lines or arrows or a text label These webs of ideas may be linked to other webs, links may be changed easily, and notes may to be added to each idea in the web All of these elements may also be converted to an outline format (Neuburg, 1997). As the teacher examines the webs or diagrams created by students, a visual representation of their prior knowledge is available for analysis.

Hypertext and hypermedia may be used by students in a like manner for assembling and linking information to present their understanding of almost any topic Hypermedia is software built on non-linear interrelationships among text and other elements. When text is linked to related text using programming commands, it is called hypertext. By adding elements that allow the user to move through text, images, and sound, a hypermedia environment is created. Hypertext and hypermedia are structured so that the user accesses information in ways that are meaningful to him or her (Jonassen, 1996) rather than through a linear presentation As students create hypermedia stacks, their existing knowledge is represented.

Simulation software also offers an opportunity for uncovering and examining student prior knowledge "Simulations put the student in an active role in an environment that has a set of rules" (Maddux, et al., 1997, p. 219) As a student begins to interact with a simulation, prior knowledge guides the choices he/she makes when selecting from the options offered. Observing the choices made as the student begins the simulation and discussing the reasons for those choices provides a rich opportunity for both the teacher and the student to explore the student's prior knowledge.

In addition to the prior knowledge and understanding students bring to the learning situation, they also bring interests. As noted previously, teachers who create learning environments that enable the learning process structure activities that build on students' current interests. Technology can be used to help identify those interests. Allowing students to create hypermedia stacks or to use knowledge mapping software to create idea webs about self-selected topics can provide teachers a clearer picture of students' interests

Once student interests and prior knowledge are identified, teachers guided by constructivist learning theory base learning experiences on both Often, however, teachers cannot respond to the multitude of student interests due to lack of resources available in the classroom or the school Technology can provide access to resources that build on students' interests (Irving, 1991; Riel, 1994, Swan and Mitrani, 1993). Databases of information available on CD-ROM or on the Internet, however, allow students to examine a multitude of topics that may be of unique interest to an individual student (McDaniel and McInerney, 1992).

Means and Olson (1997) found technology can support teachers' efforts to engage students in long-term, complex projects by dramatically enhancing student motivation and self-esteem, making obvious the need of longer blocks of time, creating a multiplicity roles, leading to student specialization in different aspect of technology use, instigating greater collaboration, and giving teachers additional impetus to take on a coaching and advisory role Numerous other studies have demonstrated the increased motivation and engagement of students when they use technology (Dimock, 1996; Deal, 1995; Ferneding-Lenert and Harris, 1994, Harasim, 1989, Lowry et al., 1994; Mason, 1989; Moore and Karabenick, 1992, Ross et al., 1990, Ryser et , 1995; Sandholtz et al , 1997; Velayo, 1993; Williams, 1995). One study, focused on students with limited English proficiency (LEP) who used videodiscs as part of instruction over a three year period, reported that these students had significantly stronger agreement with statements such as· "I like my science class," "We do fun things in science," "My friends like science," and "I would like to take more science" than LEP students in conventional classrooms (Barrutia, Bissell, Rodriguez, and Scarcella, 1993)

It may be concluded that it is learning with, not from or about, technology that makes computer based technology an important tool in a constructivist learning environment In order to capitalize on the potential of new technology, and particularly digital technology as a teaching tool there is an urgent need of the professional development of teachers. Professional development that allows teachers to construct professional knowledge about pedagogy, content, and technology, as well as strategies for managing the changing classroom environments brought about with the creation of constructivist learning environments supported by technology. To achieve this, there is need of providing learning experiences to the teachers. These experiences should be situated in an authentic context for teachers, their school and classroom. It should build on their prior knowledge and provide opportunities for social interaction with colleagues. It should begin with investigation of problems supported by technology that are relevant to teachers. By providing such learning experiences to the teachers, we can enable them to create learning experiences appropriate for the children of the Information Age.

1.4.0 Integrating Digital Technology Into Constructivist Learning Environment

The constructivist revolution offers a new vision of the learner as an active sense-maker and suggests new methods of instruction. It facilitates presentation of materials in a constructivist way and engage students in an active explorative learning. This new approach allows the learners to have more control over their own learning to think analytically and critically, and to work collaboratively. This constructivist approach is an effort at educational reform made easier by technology In this process the learner has access to global rather than local software and maintain a direct link to the teacher This interactivity may take the form of a direct e-mail link, electronic conferencing or an automated connection to a server programme. This is a revolutionary vision of education. In view of the above here an attempt has been made to integrate digital technology into constructivist learning environment for effective learning

In recent years we have seen the birth of Information Age. The Information Age has largely been made possible by the advent of digital technology, and it has resulted in an explosion in number of sources of information and images, which are available to us. But teaching, and the world of education more generally, have not taken the advantage of these changes. We have largely failed to capitalize on the potential of the new technologies, and particularly digital technology as a teaching tool.

Our education system must respond to the transformations that are being brought by technology, and by digital technology in particular. Such technology has the ability to revolutionize the way our children and we learn and also can revolutionize the whole teaching learning system

As society moved from the Industrial Age to the Information Age, the technology was applied to teaching. Visual presentation moved from the chalk-board to transparency projectors, media moved from filmstrip to video, and access to internet enhanced communication worldwide. But it is important to keep in mind that this technology is merely a learning medium. It can ever be a bridge, never a destination Computers may help the students learn but it cannot make the students learn It is the imagination and creativity of the professionals within education and the digital world that will determine the pace and the quality of change. In this new age of digital technology the creativity and the imagination of teachers will remain as critical as they have always been. If learning is the heart of new digital world then teacher its lifeblood In fact teacher not technology is the key to the future. Without good teachers we have no future

A good teacher needs to have the ability to inspire and arouse curiosity and need to be a coach, colleague and friend. It is feasible only in a constructivist-learning environment. Constructivism implies that effective learning does not occur when students read a chapter, listen to a lecture, take notes and prove their knowledge in a testing situation Real learning occurs when student investigate a concept, find information, discuss it and create something with it The integration of technology facilitates this investigation, discussion and creation; it allows the teacher to be the guide. Students become empowered and spend more time in active construction of knowledge when using technology. Technology provides more resources for student use in problem solving, thinking and reflection Students spend more time collaborating with other students and communicating with teachers.

1.4.1 What is constructivism?

Constructivism is basically a theory -- based on observation and scientific study -- about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences

In the classroom, the constructivist view of learning can point towards a number of different teaching practices In the most general sense, it usually means encouraging students to use active techniques to create more knowledge and then to reflect on and talk about what they are doing and how their understanding is changing

Constructivism does not dismiss the active role of the teacher or the value of expert knowledge. Constructivism modifies that role, so that teachers help students to construct knowledge rather than to reproduce a series of facts The constructivist teacher provides tools such as problem-solving and inquiry-based learning activities with which students formulate and test their ideas, draw conclusions and inferences, and pool and convey their knowledge in a collaborative learning environment Constructivism transforms the student from a passive recipient of information to an active participant in the learning process. Always guided by the teacher, students construct their knowledge actively rather than just mechanically acquiring knowledge from the teacher or the textbook. Students become engaged by applying their existing knowledge and real-world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings.

1.4.2 Our past experiences about learning

Mayer (1992) has shown how three views of learning have emerged during the past 100 years of research on learning **(i) learning as response strengthening (ii) learning as knowledge acquisition (iii) learning as knowledge construction** According to the first view, learning occurs when learner strengthens or weakens an association between a stimulus and a response. This first view i.e **learning as response strengthening** developed in the first half of 20th century and was based largely on the study of animal learning in artificial laboratory settings. The role of learner is to passively receive rewards and punishments, whereas the role of instructor is to administer rewards and punishments, such as drill-and-practice The instructional designer role is to create environments where the learner repeatedly is cued to give a simple response, which is immediately followed by a feedback.

The second view, **learning as knowledge acquisition** is based on the idea that learning occurs when a learner places new information in long-term memory This view developed in 1950s, 1960s and 1970s and was based largely on the study of human learning in artificial laboratory settings. The role of the learner is to passively acquire information, and the teacher's job is to present information, such as in textbooks and lectures According to this view, information is a commodity that can be transmitted directly from teacher to learner. The instructional designer's role is to create environments in which the learner is exposed to large amount of information through textbooks, lectures and computer based multimedia programmes

The third view, **learning as knowledge construction**, is based on the idea that learning occurs when a leaner actively constructs a knowledge representation in working memory. This view emerged in 1980s and 1990s and was based on largely on the study of human learning in increasingly realistic settings. According to this view, the learner is a sense maker, whereas the teacher is a cognitive guide who provides guidance and modeling on authentic academic tasks. The instructional designer's role is to create environments in which the learner interacts meaningfully with academic material, including fostering the learner's processes of selecting organizing and integrating information.

1.4.3 How constructivism is different from traditional ideas about teaching and learning?

The classroom is no longer a place where the teacher pours knowledge into passive students, who wait like empty vessels to be filled in. In the constructivist model, the students are urged to be actively involved in their own process of learning The teacher functions more as a facilitator who coaches, mediates, prompts, and helps students develop and assess their understanding, and thereby their learning The table below compares the traditional classroom to the constructivist one

A constructivist learning environment differs greatly from one based on the traditional model In a traditional model, classes are usually driven by "teacher-talk" and depend heavily on text books for the structure of the course. Instruction in these classroom is based on the idea that there is fixed world of knowledge that the parts are built into a whole concept. Teachers serve as pipelines and transfer their ideas and thoughts to the learners.

Brooks and Brooks (1993) offer and interesting comparison of the visible differences between traditional classroom and constructivist classroom. The comparison is presented below:

Traditional classroom	**Constructivist classroom**
Student primarily work alone	Students primarily work in groups
Curriculum is presented part to whole, with emphasis on basic skills	Curriculum is presented from whole to part with emphasis on the big concepts
Strict adherence to a fixed curriculum is highly valued	Pursuit of student questions is highly valued
Curricular activities rely heavily on text books and workbooks of data and manipulative materials	Curricular activities rely heavily on primary sources
Students are viewed as "blank slates" onto which information is etched by the teacher	Students are viewed as thinkers with emerging theories about the world (Cognitive apprentices)
Teachers generally behave in a didactic manner, disseminating information to students	Teachers generally behave in an interactive manner mediating the environment for students
Teacher seek the correct answers to validate student lessons	Teachers seek the student's point of view in order to understand student

	learning for use in subsequent conception
Assessment of students learning is viewed as separate from teaching and occurs almost entirely through testing	Assessment of student learning is interwoven with teaching and occurs through teacher observation of students at work and through exhibitions and portfolios

In constructivist classroom teacher is a guide for the learner, provides bridging or scaffolding and helps to extend the learner's zone of proximal development The student is encouraged to develop metacognitive skills such as reflection thinking and problems solving techniques. The independent learners is intrinsically motivated to generate, discover, build and enlarge his / her own framework of knowledge

Becoming a constructivist teacher may be a difficult transformation since most instructors are prepared for teaching in the traditional manner. It "requires a paradigm shift" and "require the willing abandonment of familiar perspectives and practices and the adoption of new ones" (Brooks and Brooks, 1993, p.25).

When educators utilize constructivist strategies, students are encouraged to take responsibility in their own learning process (Wilson, 1996). As a result, students decide what they need to learn, manage their own learning activities, and also develop greater metacognitive skills If students are given the opportunity to construct their learning in relevant environments, they may develop the higher level thinking and problem solving skills that are necessary to be successful in today's world.

Key points of constructivist learning theory

- Learning is not passive or incidental, it is an active process in which learners make meaning out of their own experiences. The learner constructs knowledge through experiences of the physical world and through social interaction.
- Learning involves linking new ideas with prior knowledge through the generation, testing and re-shaping of ideas (including those ideas formerly held by the learner)
- The learner plays an active role in defining their own goals and controlling their own learning.
- Constructed meanings may be accepted and assimilated by the learner or they may ultimately be rejected by the learner.

Characteristic of the traditional model of teaching and learning

- Learning is transmissive
- The learner is a blank slate
- The logic of teaching proceeds from the logic of the discipline

A constructivist model of learning

- Learning is an interactive process (not a passive exercise in transmission of knowledge)
- Learning begins with an initiating event which motivates and directs the learner's attention to the task of learning e.g
    - A question to be answered
    - A problem to be solved
    - A challenge to be met
    - A discrepant event to be explained

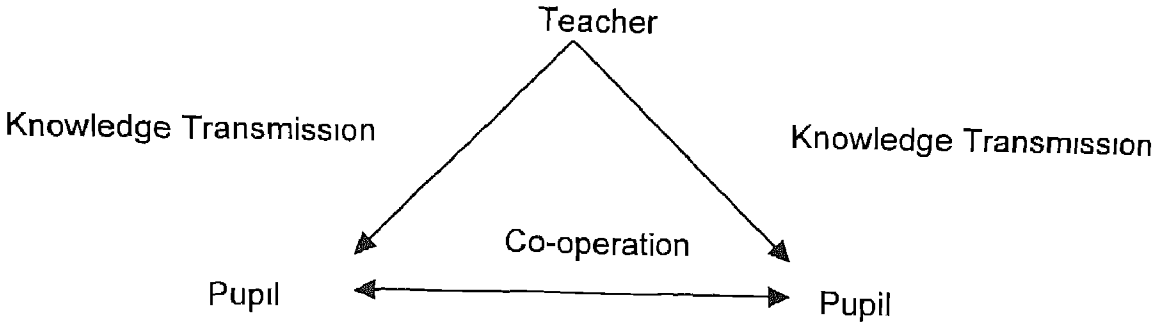
- Learning proceeds to children actively engaging in the learning process by
  - Asking their own questions
  - Stating their own existing ideas
  - Proposing hypotheses
  - Designing fair tests
  - Investigating and exploring
  - Refining their ideas
  - Stating and presenting their findings

- Interactive learning promotes
  - Development of scientific process skills
  - Development of conceptual understandings
  - Student ownership of process and products of learning

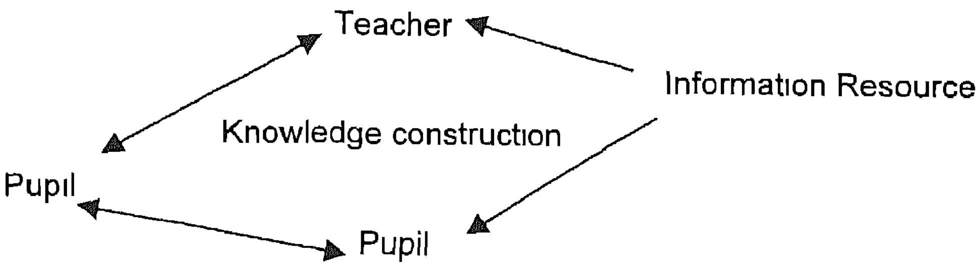
1.4.4The changing role of teacher in ICTs based interactive learning

In the traditional teaching learning situation, the relation between the teacher and the pupil is frontal –the role of the teacher is to deliver knowledge to the pupil. There is some co-operation among pupils. Teachers do not possess adequate knowledge and skills for the effective exploitation of ICTs. In many cases teachers are less expert than their pupils. Further, teachers find themselves in a situation where they are no longer the principal source and deliverer of information. In this context, teachers need to be properly trained for developing pupils' learning abilities The skills needed how to use computers as tools for learning i.e. develop a critical mind; how to make lines among different sources and types of information; and how to help pupils to construct their knowledge with ICTs.

Traditional Teacher pupil relationship



Teacher pupil relationship in emerging learning society



For effective education, it is essential that there be more opportunities for student participation in the learning process, more team work, more self-study and self-evaluation, as well as more peer evaluation and less examination oriented teaching and learning It is felt that ICTs can assist in promoting more student centred and interactive learning

The new technologies have enormous potential to revolutionize education It is obvious that the monopolies enjoyed by schools as formal education providers will diminish.

1.4.5 What the constructivist teacher has to do in his classroom?

Constructivist teacher has to use many techniques in the teaching process. For example, he may:

- prompt students to formulate their own questions (inquiry)
- allow multiple interpretations and expressions of learning (multiple intelligences)
- encourage group work and the use of peers as resources (collaborative learning)

Its primary goal is helping students learn *how to learn*

- Provide the initiation of learning by
  - Posing the question
  - Posing the challenge
  - Presenting problem or discrepant event and
  - Motivating the learner to the learning task

- Facilitate the learning activities by:
  - Defining the learning environment e g grouping, access to materials, setting the timeframe, defining expectation
  - Probing children's ideas
  - Offering guidance in the formation of hypotheses
  - Helping children refine and focus their questions
  - Helping children set up their investigation
  - Providing feedback and encouragement in the children's design of fair tests
  - Challenging children to test, apply, refine and extend their ideas

1.4.6 Constructivism articulated in the literature

Here an attempt has been made to represent the variety of ways in which constructivism is articulated in the literature. Various approaches to learning derived from constructivist epistemology are: situated cognition, anchored instruction, apprenticeship learning, problem based learning, generative learning, constructivism, exploratory learning and etc. Each approach articulated the way in which the concepts are operationalised for learning.

An orienting framework for a constructivist approach to design, teaching or learning is presented below.

Jonassen (1991) notes that many educators and cognitive psychologists have applied constructivism to the development of learning environments. From these applications, he has isolated a number of design principles

- Create real world environments that employ the context in which learning is relevant;
- Focus on realistic approach to solving real-world problems,
- The instructor is a coach and analyzer of the strategies used to solve these problem;
- Stress conceptual interrelatedness, providing multiple representative or perspective on the content;
- Instructional goals and objectives should be negotiated and not imposed;
- Evaluation should serve as a self analysis tool;
- Provide tools and environments that help learners interpret the multiple perspective of the world,
- Learning should be internally controlled and mediated by the learner (pp.11-12)

Jonassen (1994) summarizes what he refers to as "the implication of constructivism for instructional design". The following principles illustrate how knowledge construction can be facilitated:

- Provide multiple representation of reality,
- Represent the natural complexity of the real world,
- Focus on knowledge construction, not reproduction,
- Present authentic tasks (contextualizing rather than abstracting instruction),
- Provide real-world, case-based learning environments, rather than pre-determined instructional sequences,
- Foster reflective practice;
- Enable context-and content dependent knowledge construction;
- Support collaborative construction of knowledge through social negotiation (p.35)

Wilson and Cole (1991) provide a description of cognitive teaching models which "embody" constructivist concepts From these description, we can isolate some concepts central to constructivist design, teaching and learning:

- Embed learning in a rich authentic problem solving environment;
- Provide for authentic versus academic contexts for learning;
- Provide for learner control;
- Use errors as a mechanism to provide feedback on learners understanding (pp.59-61)

Paul Ernest (1995) in his description of the many schools of thought of constructivism suggest the following implication of constructivism which derive from both the radical and social perspectives

- Sensitivity toward and attentiveness to the learner's previous constructions;
- Diagnostic teaching attempting to remedy learner errors and misconception;
- Attention to metacognition and strategic self-regulation by learner;
- The use of multiple representation of mathematical concepts,
- Awareness of the importance of goals for the learner, and the dichotomy between learner and teach goals;
- Awareness of the importance of social contents, such as the difference between folk or street mathematics and school mathematics (and an attempt to exploit the former for the latter) (p 485)

Honebein (1996) describes seven goals for the design of constructivist learning environments ·

- Provide experience with the knowledge construction process,
- Provide experience in and appreciation for multiple perspectives;
- Embed learning in realistic and relevant contexts;
- Encourage ownership and voice in the learning process;
- Embed learning in social experience;
- Encourage the use of multiple modes of representation,
- Encourage self-awareness in the knowledge construction process (p 11)

An important concept for social constructivist is that of scaffolding which is a process of guiding the learner from what is presently known to what is to be known. According to Vygotsky (1978), student's problem solving skills falls into three categories:

- Skills which the student cannot perform
- Skills which the student may be able to perform
- Skills that the student can perform with help

Scaffolding allows students to perform tasks that would normally be slightly beyond their ability without the assistance and guidance from the teacher. Appropriate teacher support can allow students to function at the cutting edge of their individual development Scaffolding is therefore an important characteristic of constructivist teaching and learning

There are many similarities between the perspectives of different researchers in the above brief review of the literature Here an attempt has been made to present a synthesis of the characteristic of constructivist learning and teaching.

1.4.7 Characteristic of constructivist learning and teaching

- Goals and objectives are derived either by the learner or in negation with the teacher or system
- Teacher plays the role of facilitator, guide monitor and coach
- Learner plays a central role in mediating and controlling learning
- Knowledge construction and not reproduction is emphasized
- Knowledge construction takes place in individual contexts and through social negotiation, collaboration and experiences
- Learners' previous knowledge, beliefs and attitudes are considered in the knowledge construction process
- Learning environments are created where activities, opportunities, tools are provided to encourage metacognition, self-analysis, self-regulation, self-reflection and self-awareness
- Content, skills, tasks and learning situation are relevant, realistic, authentic and represent the natural complexities of the 'real world'
- Primary sources of data are used to ensure authenticity and real-world complexity
- Problem-solving, critical and creative thinking skills and deep understanding are emphasized

- Wrong answers provide the opportunity for insight into students previous knowledge construction
- Learners are encouraged to explore the new knowledge independently and to manage the pursuit of their goal
- Learners are provided with the opportunity for apprenticeship learning in which there is an increasing complexity of tasks, skills, and knowledge construction
- Conceptual interrelatedness and interdisciplinary learning are emphasized which reflex knowledge complexity
- Collaborative and cooperative learning are focused in order to expose the learner to alternative viewpoints and encourage social interaction
- Scaffolding is facilitate to enable students perform just beyond the limits of their ability
- Assessment is interwoven with teaching

No doubt there are many teachers who, without knowing the term constructivism, without having been informed of the theory, without following a prescriptive design, are providing the students in their care with opportunities for constructivist learning. As Von Glasersfeld (1995) comments:

Constructivism does not claim to have made earth-shaking inventions in the areas of education; it merely claims to provide a solid conceptual basis for some of the things that, unit now, inspired teachers had to do without theoretical foundation.

This comment reveals that constructivism is more than a theory of learning. It is a way of looking at the world that is broad enough to allow for multiple interpretations and provide a perspective that can explain complex and abstract phenomenon and can guide our action.

In a constructivist classroom, learning is

Constructive: Students are not blank slates They come to learning situations with already formulated knowledge, ideas, and understandings. This previous knowledge is the raw material for the new knowledge they will create.

Active: The student is the person who creates new understanding for him/herself. The teacher coaches, moderates, suggests, but allows the students to experiment, ask questions, try things that don't work Learning activities require the students' full participation (like hands-on experiments). An important part of the learning process is that students reflect on, and talk about, their activities. Students also help set their own goals and means of assessment.

Reflective: Students control their own learning process, and they lead the way by reflecting on their experiences. This process makes them experts of their own learning. The teacher helps create situations where the students feel safe questioning and reflecting on their own processes, either privately or in group discussions The teacher should also create activities that lead the student to reflect on his or her prior knowledge and experiences. Talking about what was learned and how it was learned is really important.

Collaborative: The constructivist classroom relies heavily on collaboration among students. The main reason it is used so much in constructivism is that students learn about learning not only from themselves, but also from their peers. When students review and reflect on their learning processes together, they can pick up strategies and methods from one another.

Inquiry based: The main activity in a constructivist classroom is solving problems. Students use inquiry methods to ask questions, investigate a topic, and use a variety of resources to find solutions and answers. As students explore the topic, they draw conclusions, and, as exploration continues, they revisit those conclusions. Exploration of questions leads to more questions.

Evolving: Students have ideas that they may later see were invalid, incorrect, or insufficient to explain new experiences These ideas are temporary steps in the integration of knowledge For instance, a child may believe that all trees lose their leaves in the fall, until he/she visits an evergreen forest. Constructivist teaching takes into account students' current conceptions and builds from there

1.4.8 History of constructivism

The concept of constructivism has roots in classical antiquity, going back to Socrates's dialogues with his followers, in which he asked directed questions that led his students to realize for themselves the weaknesses in their thinking. The Socratic dialogue is still an important tool in the way constructivist educators assess their students' learning and plan new learning experiences.

Jean Piaget and John Dewey developed theories of childhood development and education, what we now call Progressive Education that led to the evolution of constructivism

Piaget believed that humans learn through the construction of one logical structure after another. He also concluded that the logic of children and their modes of thinking are initially entirely different from those of adults The implications of this theory and how he applied them have shaped the foundation for constructivist education. Dewey called for education to be grounded in real experience Inquiry is a key part of constructivist learning.

Among the educators, philosophers, psychologists, and sociologists who have added new perspectives to constructivist learning theory and practice are Lev Vygotsky, Jerome Bruner, and David Ausubel.

Vygotsky introduced the social aspect of learning into constructivism. He defined the "zone of proximal learning," according to which students solve problems beyond their actual developmental level (but within their level of potential development) under adult guidance or in collaboration with more capable peers. Bruner initiated curriculum change based on the notion that learning is an active, social process in which students construct new ideas or concepts based on their current knowledge Ausubel introduced the concept of meaningful learning, which constitutes an important part of constructivist learning

Seymour Papert's groundbreaking work in using computers to teach children has led to the widespread use of computer and information technology in constructivist environments

Modern educators who have studied, written about, and practiced constructivist approaches to education include John D. Bransford, Ernst Von Glasersfeld, Eleanor Duckworth, George Forman, Roger Schank, Jacqueline Grennon Brooks, and Martin G Brooks.

1.4.9 Some critical perspectives of constructivism

Constructivism has been criticized on various grounds Some of the charges that critics level against it are:

It's elitist. Critics say that constructivism and other "progressive" educational theories have been most successful with children from privileged backgrounds who are fortunate in having outstanding teachers, committed parents, and rich home environments. They argue that disadvantaged children, lacking such resources, benefit more from more explicit instruction.

Social constructivism leads to collaboration Critics say the collaborative aspects of constructivist classrooms tend to produce a "tyranny of the majority," in which a few students' voices or interpretations dominate the group's conclusions, and dissenting students are forced to conform to the emerging consensus.

There is little hard evidence that constructivist methods work. Critics say that constructivists, by rejecting evaluation through testing and other external criteria, have made themselves unaccountable for their students' progress.

1.4.10 Benefits of constructivism

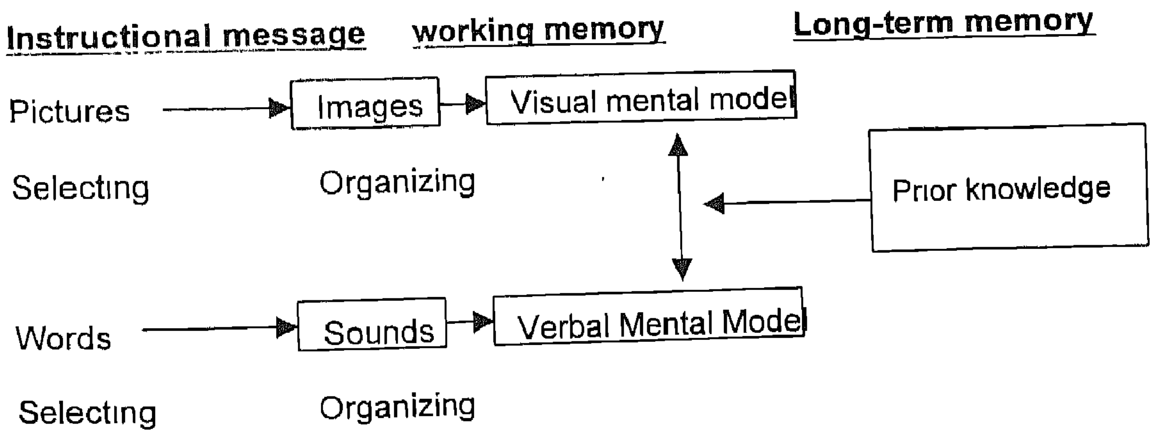
- Children learn more, and enjoy learning more when they are actively involved, rather than passive listeners.
- Education works best when it concentrates on thinking and understanding, rather than on rote memorization. Constructivism concentrates on learning how to think and understand.
- Constructivist learning is transferable. In constructivist classrooms, students create organizing principles that they can take with them to other learning settings.
- Constructivism gives students ownership of what they learn, since learning is based on students' questions and explorations Engaging the creative instincts develops students' abilities to express knowledge through a variety of ways. The students are also more likely to retain and transfer the new knowledge to real life.
- By grounding learning activities in an authentic, real-world context, constructivism stimulates and engages students Students in constructivist classrooms learn to question things and to apply their natural curiosity to the world.
- Constructivism promotes social and communication skills by creating a classroom environment that emphasizes collaboration and exchange of ideas Students must learn how to articulate their ideas clearly as well as to collaborate on tasks effectively by sharing in group projects. Students, therefore, exchange ideas and so learn to negotiate with others and to evaluate their contributions in a socially acceptable manner. This is essential to success in the real world, since they will always be exposed to a variety of

experiences in which they will have to cooperate and navigate among the ideas of others

1.4.11 Model to highlight the three crucial processes in constructivist learning

Constructivist learning depends on the activation of several cognitive processes in the learner during learning, including selecting relevant information, organizing incoming information, and integrating incoming information with existing knowledge. This is called as the **SOI model** to highlight three crucial cognitive processes in constructivist learning: S for selecting, O for organizing, and I for integrating (Mayer, 1996) Constructivist theory focuses that knowledge is constructed by the learner in working memory. In this construction process the learner uses both incoming material from the environment and prior knowledge from long-term memory The SOI model is a theory of learning that can be used to generate instructional implications

SOI model



Selecting relevant information The first process is the selection of relevant information for further processing. When words and pictures are presented to learn in an instructional message, the learner represents them briefly in sensory memories, because of the limited capacity of the human information-processing system. Only some of these representations can be retained for further processing in working memory.

Organizing incoming information· The next process involves organizing the selected auditory representation into a coherent verbal representation and organizing the selected images into a coherent pictorial representation. In this process the retained visual images are connected by appropriate links (such as cause and effect) and retained verbal representations are connected by appropriate links (such as cause and effect). This activity takes place in working memory The outcome of this process is the construction of a coherent pictorial representation and a coherent verbal representation

Integrating incoming information: In the third process, students make one-to-one connections between corresponding elements of the pictorial and verbal representations they have constructed using prior knowledge

A final step in learning process is encoding, in which the mental representations constructed in working memory are stored in long-term memory for permanent retention

1.4.12 Internet technology and Constructivist Learning

Internet technology has made a substantial contribution to education The emphasis now continues to shift from Computer Based Learning (CBL) and its related methods such as Computer Assisted Instruction (CAI) to Internet Based Learning

There appear to be two main options. One is a form of distance learning in which a teacher places course-materials on a web server, which can be accessed by remote students This approach follows a prescriptive pattern It allows all the teaching materials to be validated at source and integrated into the course. However, it may be an expensive way to provide enough software to meet the demands of complete syllabus. The alternative is a type of independent study in which learners search the internet for material that are relevant to their interests. This is a more constructive process that can provide access to a media range of course-ware and multiple views of a subject area but the suitability of the material for a taught course cannot be guaranteed.

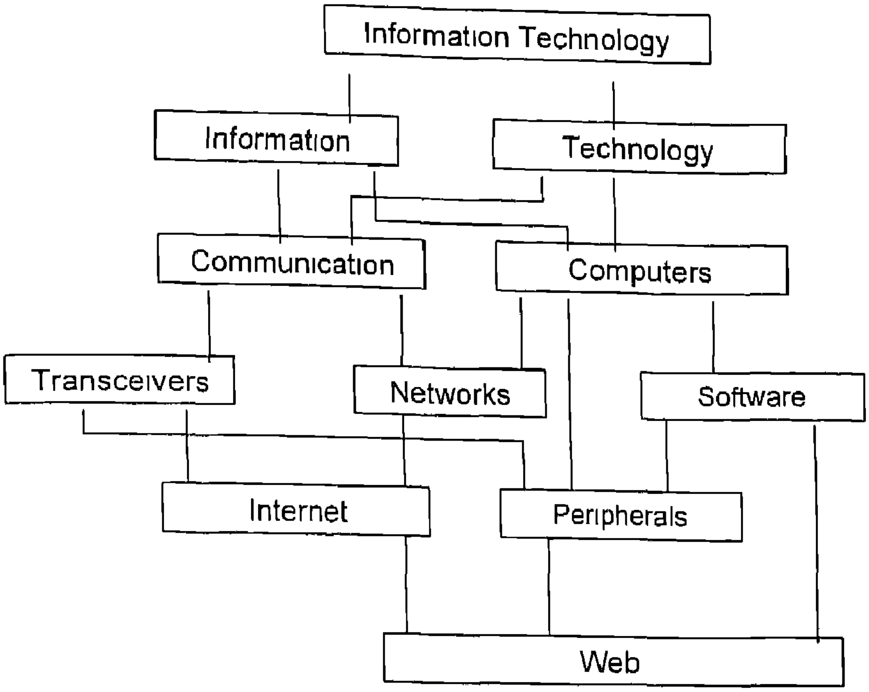
These two modes can be combined to form a more general approach that may be described as Internet Based Learning (IBL). It includes any process in which a learner is provided with access to course-materials stored in the Internet. It requires a model of teaching that combines the advantages of both prescriptive and constructive learning by selecting appropriate materials and admitting a wide range of views of a subject. It should facilitate a learning style that has been described as **guided discovery**.

This new approach allows the learners to have more control over their own learning to think analytically and critically, and to work collaboratively This constructivist approach is an effort at educational reform made easier by technology. In this process the learner has access to global rather than local software and maintain a direct link to the teacher. This interactivity may take the form of a direct e-mail link, electronic conferencing or an automated connection to a server programme.

Internet information is usually accessed through the hypertext protocols of World Wide Web. Some authors are of the opinion that an unstructured presentation is more conducive to learning by forcing the learner to construct a personal knowledge map. Other prefers to offer more direction in the form of a navigable interface that relates to the structure of the subject. Both views have their merits, but for an open learning system such as the Internet a structured interface appears to be more appropriate.

The most widely used information structure is that of object oriented hierarchy, this model is popular because it appears to reflect the way people assimilate and process information Books have such structures with object forming a hierarchy of chapter, section and smaller components and a user interface in the form of a content page. More appropriately, computer filing system and user interface such as that of Microsoft windows have object-oriented structures. From the point of view of constructivist theory the wide use of concept maps and schemes supports the view that personal knowledge is either object oriented or can be related to information having such a structure.

Object oriented model have been developed for a number of course. These are delivered on an internal network and the Internet. The structure adopted for the course on information technology is illustrated in figure given below. This is derived from a simple list representing the content of a book. It can be regarded as concept map that might be drawn by the course designing in which the objects correspond to the nodes and the link describe the relationships between them It is descried now as a study map. It represents the same view of the subject area as the book treatment but the some additional fitness in the form of navigational information indicating the sequence in which the objects may be studied. This is necessary to complete the hierarchical logic. Other peripheral objects can be added to show the entire course linked to entire knowledge.



In developing the hierarchy, it is inferred that an object at one level should be logical component of another at the level immediately above. This principle of composition is easily satisfied at the higher levels but break down at the lower ones. However, it generates a paradoxical relationship in which one object is seen as a component of another, which is a component of a first one Each object is recognized as a complete treatment of its associated topic rather than a component of a more abstract one. The links between the adjacent objects describe a more subtle relationship than simple composition. In object oriented theory they can be related to a hierarchical model based on composition and another property known as inheritance.

In the present context, it is sufficient to accept the empirical conclusion that the objects are complete treatments of the topics and the links define two-way relationship between adjacent topics in which each can be viewed as a component of other The result may be descried as constructivist information system. Any object can be expanded in this way. This is firmly in line with the constructivist principle and it is a format that is readily available on the Internet.

The constructivist revolution offers a new vision of the learner as an active sense-maker and suggests new methods of instruction. It facilitates presentation of materials in a constructivist way and engage students in an active explorative learning. This new approach allows the learners to have more control over their own learning to think analytically and critically, and to work collaboratively. This constructivist approach is an effort at educational reform made easier by technology. In this process the learner has access to global rather than local software and maintain a direct link to the teacher. This interactivity may take the form of a direct e-mail link, electronic conferencing or an automated connection to a server programme. This is a revolutionary vision of education.

1.5.0 Objectives of the Project

- To develop a package for the secondary teacher educators on internet based learning with a view to enable them on the (i) use of constructivist mode of teaching and learning, and on the (ii) functioning of Internet.

CHAPTER-II

METHODOLOGY

2.0.0 NATURE OF THE PROJECT

This project was undertaken to develop a package for the orientation of the teacher educators on Internet based learning. The package was developed through workshops by a group of experts held at Regional Institute of Education, Bhubaneswar.

2.1.0 Project Design

The project was conducted in one phase. Internet based teaching learning strategies were identified and modules were developed through workshop.

2.1.1 Development of modules

Modules were developed in consultation with a group of experts through workshop held at Regional Institute of Education, Bhubaneswar from 26-30 December 2003 and from 6-8 March 2004. Workshop method, interactive and participatory mode was followed at different steps during the process of development of this package. Before developing modules materials were collected from different web sites and were reviewed by the experts. The Internet based teaching learning strategies were selected keeping in view the ground realities of the classroom situation The steps were minimized and simplified for the convenience of the teacher educators The format of the module is presented below

Format of the training module

The preceding discussions under lesson plan guide would no doubt provoke sufficient ideas and thoughts necessary in preparing a good lesson plan. It is also necessary, on the part of a teacher to know as how to proceed exactly in constructing a lesson plan The following specific steps would serve the purpose.
:

A. Formulation of Objectives

Formulation of objectives forms the bases for entire instructional activities of a teacher. In this section the teacher needs to state the knowledge and the skill that the students are expected to gain or perform at the end of the lesson.

B. Content Overview

This section presents a brief description of the contents, which the students are supposed to cover. This may contain, for example, the main characters, the major events, activities, relationships, opinions or attitudes

C. Pre-Internet Activities

All the activities under this section must be practiced with the whole class at a time. The main activities here fall into two types as follows

(i) Formulating learning tasks

The whole contents of the lesson, to be dealt with, must be broken into suitable tasks, each revolving around an essential question An essential question is defined as a question that requires students to make a decision or plan a course of action.

(ii) Identification of key points

The key words of phrases, representing an idea or concept, contained in the lesson should be exposed. The words or phrases so identified must be grouped on the basis of different dimensions of the lesson so as to facilitate searching information about various dimensions from the Internet

D. Internet Based Activities

All the activities under this section must be practiced with small groups consisting of 3-4 members. Therefore, the class will be divided into groups to undertake the following activities:

(i) Exploration of Information

Teacher gives information about various websites and other digital resources, e.g. digital encyclopedia.

(ii) Selecting Appropriate Information

After the collection of information, from various sites and other digital resources, by the students, the teacher asks them to select appropriate information out of those. This can be done for example, by cross checking the reliability of the information collected from multiple sources.

E. Extended Activities

Each group collects materials at his level from school library and other sources. The members then sit in their respective group and share their views. The group report is prepared synthesizing the materials collected from different sources including, Internet, books, teachers and views of members.

F. Presentation and Evaluation

In this step the groups make power point presentation of their work and the teacher assesses their performance using some kind of grading rubric.

G. Discussion

In this section the teacher will initiate discussion pertaining to the issues involved during the use of Internet and other resources-digital and non-digital. This can be done through question-answer or collection of views etc

2.1.2 Review and finalization of the modules on training strategies

The modules developed in the workshop were reviewed and finalized by the programme coordinator and a group of experts and were included in this package.

2.2.0 Target Users of the Package

The package is primarily developed for the orientation of teacher educators. The package, however, may be used by teachers, researchers, educational administrators, supervisors, parents, and community members at large interested in the field of education

CHAPTER-III

INTERNET BASED LEARNING

3.0.0 OBJECTIVES

This module on Internet based learning will enable you to know:

3.1.0 Fundamentals of Internet Based Learning

3 2.0 Lesson Plan Guide

3.3 0 Assignment Organizer for the Students

3.4 0 Resources for Lesson Plan Ideas

3.5.0 Basic Steps of a Lesson Plan

3.6 0 Lesson Plans on Internet Based Learning

3.1.0 Fundamentals of Internet Based Learning

Internet technology has made a substantial contribution to education. The emphasis is now continues to shift from Computer Based Learning (IBL) and its related methods such as Computer Assisted Instruction (CAI) to Internet Based Learning (IBL). This implies the following uses of Internet for the purpose of education

- The Internet as a technology of information
- The Internet as a technology of sociality.
- The Internet as a technology of interaction

The Internet as a technology of information can bring large stuck of data, reference in any form (text, graphics, sound, visual) Internet may serve a good medium of interaction and sociality between people via communication technologies and promotes cognitive processing among sociality dimension. The strength and quality of interaction and sociality however depends much on the nature of the website, the way these are designed.

Internet Based Learning involves:

(i) Using the internet as an accessible library within which students browse more freely than before,

(ii) Using the Internet to publish – for students – new kinds of textbooks. Written in hypertext and multimedia, rapidly changeable and expandable,

(iii) Using the internet as the class room itself ----- with electronic white boards, real time and asynchronous discussion and places where students can write notes, swap files and do all that is normally done face to face;

(iv) Using the Internet as a place of creation and publication, challenging students to thrive in an information and communication environment, which unlike others, they can access directly.

- In each case the following are likely to be important
- Electronic documents publishing (one way);
- Computer mediated communications (two way);
- A clearly articulated 'organizing space' (probably a website),
- Scheduling that accounts for time / space effects of rote learning;
- Exchange of information by electronic means;
- Commitment to exploit internet-based resources,
- Assigning to different modes (Print, Oral, Electronic) of information and communication, different functions based on the mode.
- Interactivity based on automated routines (i.e. computer graded assignments; automated mail responses)
- A mixture of activity done 'on screen' and 'off screen'.

There appears to be two main options One is a form of distance learning in which a teacher places course materials on a web server, which can be

accessed by remote students This approach follows a prescriptive pattern. It allows all the teaching materials to be validated at source and integrated into the course. However it may be expensive way to provide enough software to meet the demands of complete syllabus. The alternative is a type of independent study in which learners search the Internet for materials that are relevant to their interest. This is a more constructive process that can provide access to a media range of courseware and multiple views of a subject area but the suitability of the material for a taught course cannot be guaranteed.

These two modes can be combined to form a more general approach that may be described as Internet based learning. It includes any process in which a learner is provided with access to course materials stored in the Internet. It requires a model of teaching that combines the advantages of both prescriptive and constructive learning by selecting appropriated materials and admitting a wide range of views of a subject. It should facilitate a learning style that has been described as guided discovery.

This new approach allows the learners to have more control over their own learning to think analytically and critically, and to work collaboratively. Internet Based Learning is founded upon constructivist pedagogy As such learners are free and creative individuals who construct their own knowledge in a chosen content area through inquiry, exploration, information analysis, gathering and synthesizing. This requires higher meta-cognition skills. Internet Based Learning may be carried out as collaborative learning.

3.1.0 Lesson Plan Guide

Teachers often raise number of questions regarding how to write a good lesson plan Lesson plan should be detailed and complete enough so that any teacher knowledgeable in the subject matter could deliver the lesson without needing further clarifications. Some action research conducted by Tigi et al.

(1998) revealed some tips and guidelines for preparing lesson plans. These guidelines typically answer the following three questions: (i) Where are the students going? (ii) How are they going? (iii) How will the teacher know they have arrived? The following items form the organization of the plan:

Goals

Goals determine purpose, aim, and rationale for what teacher and students will engage in during class time. This section use to express the intermediate lesson goals that draw upon previous plans for further knowledge acquisition. The goals are broad and adhere to State of National Curriculum standards The following set of questions can be used to guide the teacher in formulating the goals.

- What are the broader objectives, aims, or goals of the unit plan?
- What are the goals for this unit?
- What does the teacher expect students to be able to do by the end of this unit?

Objectives

This section focuses on what the students will do to acquire further knowledge and skills. The objectives are drawn both from the broader aims of the unit plan and the course contents.

The following set of questions can be used to guide the teacher in formulating the objectives:

- What will students be able to do during this lesson?
- Under what conditions will students' performance be accomplished?
- What is the criterion on the basis of which satisfactory attainment of the objectives will be judged?

- How will students demonstrate that they have learned and understood the objectives of the lesson?

Materials

This section has two functions. it helps other teachers to determine how much preparation time, resources, and management will be involved in carrying out this plan; and what materials, books, equipment, and resources they will need to get ready A complete list of materials, including full citations of textbooks or story-books used, worksheets, and any other special considerations are most useful.

The following set of questions can be used to guide the teacher preparing the list of materials.

- What materials will be needed?
- What textbooks or story books are needed?
- What needs to be prepared in advance?

Overview of Lesson

This section provides a general overview of the lesson in terms of major thrusts, activities, purpose, and events.

The following set of questions can be used to guide the teacher in preparing overview of the lesson.

- What is unique about the lesson?
- How did the students like it?
- What level of learning is covered by this lesson plan?

Lesson Procedure / Teaching – Learning Activities

This section provides a detailed, description of how to proceed with implementation of the lesson plan. It also focuses on what the teacher as well as the students should do during the lesson. This section is divided into several phases. These phases can mainly be grouped under (i) introductory activities, (ii) main activities, and (iii) closure.

The following set of questions can be used to guide the teacher in designing teaching-learning activities at different phases.

A. *Introductory activities*

- How will you introduce the ideas and objectives of the lesson?
- How will you get students' attention and motivate them in order to hold their attention?
- How can you tie lesson objectives with student interests and past classroom activities?
- What will be expected of students?

B. *Main activities*

- What is the focus of the lesson?
- How would the flow of the lesson be described to facilitate other teachers who will replicate it?
- What does the teacher do to facilitate learning and manage the various activities?
- What are some good and bad examples to illustrate what you are presenting to students?
- How can the materials be presented to ensure benefit of each student from the learning experience?
- How will each student participate in the learning process actively?

- How will learning experiences be meaningful to the learner?

C. Closure / Conclusion

- How will the ideas be pooled together at the end?
- How will the students be provided feedback so as to correct their misunderstanding and reinforce their learning?
- What activities can be suggested for enrichment and remediation?
- What lesson might follow as a result of this lesson?

Evaluation

This section focuses on ensuring that students have arrived at their intended destination. The teacher need to gather some evidence that they did. This is usually done by gathering and assessing students' work

The following set of questions can be used to guide the teacher in planning for student evaluation.

- How will you evaluate the objectives that were identified?
- Have students practiced what you are asking them to do for evaluation?

3.2.0 Assignment Organizer for the students

Assignment organizer is a user friendly tool which guides students to act in right direction. This is to be prepared by the teacher with great caution and clarified to the students in the introductory phase of a lesson. A content free and interactive assignment organizer with six major components is presented below. This can be treated as exemplary rather than exhaustive or final.

A Task definition

(I) What am I supposed to do?

- Describe and label the key points of a lesson
- Gather information about the lesson and record them
- Create a multimedia presentation

(II) What Information do I need to do this?

- Search the web sites
- Keep record on the specific questions assigned

B. Information Seeking Strategies

(I) What are the possible sources to find information?

- Specific web sites
- Electronic encyclopedia
- Books

(II) Which ones are best for me to use?

- Internet
- Encyclopedia
- Books

C. Location Access

(I) Where can I find these sources?

- Public library computers
- School library computers

- Classroom computers

(II) Who can help me find what I want?

- Teacher
- Librarian
- Computer-literate person

D. *Use of Information*

(I) How will I record the information that I find?

- Take notes
- Write notes on classroom data chart
- Other

(II) How will I give credit to my sources?

- Write title, author, page number

E. *Synthesis*

(I) What product or performance will I make to finish my assignment ?

- Concept map
- Report
- Slide

F. *Evaluation*

(I) How will I know that I have done my best?

- What I made to finish the assignment is what I was supposed to do in task definition.
- Information found in D. (i e. use of information) matches information needed in A (i.e. task definition)
- My work is neat
- My work is complete

3.3.0 Resources for Lesson Plan Ideas

The teachers can access the following resources that guide in preparing good lesson plans.

- The Gateway SM Collection list

http://www.thegateway.org/collectiosns.html

- PBS Teacher Source

A large collection of lesson plans, teacher guides, and online student activities correlated to 90 sets of state and national curriculum standards
http.//www.pbs.org/teachersource

- Discovery Channel School
  http.//www.school discovery.com
- Best of Education World 2002
  http·//www education-world.com/bestof/2002/
- Education World-Lesson Planning Centre
  http·//www.education-world com/a_lesson/
- Education World – National Standards
  http://www.edcuation-world com/standards/edcuational/index.shtml

3.4.0 Basic Steps of a Lesson Plan

The preceding discussions under lesson plan guide would no doubt provoke sufficient ideas and thoughts necessary in preparing a good lesson plan. It is also necessary, on the part of a teacher, as how to proceed exactly in constructing a lesson plan. The following specific steps would serve the purpose :

A. Formulation of Objectives

Formulation of objectives forms the bases for entire instructional activities of a teacher. In this section the teacher needs to state, in behavioral terms, the knowledge and the skills, that the students are expected to gain or perform at the end of the lesson.

B. Content Overview

This section presents a brief description of the contents, which the students are supposed to cover. This may contain, for example, the main characters, the major events, activities, relationships, opinions or attitudes.

C Pre-Internet Activities

All the activities under this section must be practiced with the whole class at a time. The main activities here fall into two types as follows:

(i) Formulating learning tasks

The whole contents of the lesson, to be dealt with, must be broken into suitable tasks, each revolving around an essential question. An essential question is defined as a question that requires students to make a decision or plan a course of action.

(ii) Identification of key points

The key words of phrases, representing an idea or concept, contained in the lesson should be exposed. The words or phrases so identified must be grouped on the basis of different dimensions of the lesson so as to facilitate searching information about various dimensions from the Internet.

D. Internet Based Activities

All the activities under this section must be practiced with small groups consisting of 3-4 members Therefore, the class will be divided into groups to undertake the following activities:

(i) Exploration of Information

Teacher gives information about various websites and other digital resources, e.g. digital encyclopedia.

(ii) Selecting Appropriate Information

After the collection of information, from various sites and other digital resources, by the students, the teacher asks them to select appropriate information out of the collected materials This can be done for example, by cross checking the reliability of the information collected from multiple sources

E. Extended Activities

Each group collects materials at his level from school library and other sources. The members then sit in their respective group and share their views. The group report is prepared synthesizing the materials collected from different sources including, Internet, books, teachers and views of members

F. Presentation and Evaluation

In this step the groups make power point presentation of their work and the teacher assesses their performance using some kind of grading rubric.

G Discussion

In this section the teacher will initiate discussion pertaining to the issues involved during the use of Internet and other resources-digital and non-digital. This can be done through question-answer or collection of views etc.

3.5.0 Lesson Plans on Internet Based Learning

Five exemplary lessons developed in the workshops are presented below for the implementation of Internet based learning in the classroom situation.

LESSON PLAN NO.1

Grade Level	:	IX
Subject	:	Social Studies
Topic	:	Fundamental Rights
Duration	:	Two days

1. Expected Learning Outcomes

(I) Students use reference tools such as dictionaries, books, internet and research tools such as interviews and surveys to find the information they need to meet specific demands, explore interests or solve specific problems

(II) Students understand the democratic principles of justice, equality, responsibility, and freedom and apply them to real life situations

(III) Students explain the similarities and differences in the fundamental rights of the people in other parts of the world

(IV) Students learn from each other about the lesson.

(V) Students develop their own concept of fundamental rights.

(VI) Students draw a visual map of their concept of fundamental rights and related issues.

2. Overview of the Lesson

The constitution of India guarantees six fundamental rights : (i) right to equality, (ii) right to freedom, (iii) right against exploitation, (iv) right to freedom of religion, (v) cultural and educational rights, and (vi) right to constitutional remedies. These rights are fundamental or basic human rights Every citizen, in a democratic country need these rights in order to grow as a balanced or responsible citizen. A citizen has the right to go to the court of law if she/he is denied these rights.

The constitution guarantees that all citizens will be equally protected by the laws of the country. The state can't discriminate against a citizen on the basis of race, caste, sex, religion or place of birth. But the right to equality contains exceptional provision too The constitution provides for special provision in the form of reservations for schedules castes, scheduled tribes and other backward classes

The right to freedom is actually a cluster of the following six freedoms. (i) the right to speech and expression, (ii) the right to assemble peacefully and without arms; (iii) the right to form association or unions; (iv) the right to move freely throughout the territory of India; (v) the right to reside and settle in any part of the territory of India, and (vi) the right to practice any profession or to carry on any occupation, trade or business. The constitution also imposes restrictions on these rights in the interest of the independence, sovereignty, and integrity of India

Right against exploitation is a legal weapon to protect today's children. The constitution forbids employing of children below the age of 14 years in dangerous jobs like factories and mines.

Right to freedom of religion provides religious freedom to all the citizens of India. All religions are equal before the state and no religion will be given preference over the other. Religious communities can set up charitable institutions of their own. Establishing a charitable institution can also be restricted in the interests of public order, morality and health.

The constitution provides special measures to protect the rights of the minorities. Any community, which has a language and script of its own, has the right to conserve and develop them All minorities - religious or linguistic, can set up their own educational institutions

Right to constitutional remedies empowers the citizens to go to the court in case of denial of any of the fundamental rights. The right is suspended by the central government, when an emergency is declared. After the emergency is revoked this right comes back into force.

3. Teaching Learning Activities

A Pre-Internet Activity

1 Formulating the Learning tasks

The teacher initiates a discussion session with the following questions to explore only the different dimensions of 'Fundament rights' so that pupils can make a decision regarding their course of action during Internet activity.

Q. What are you entitled to as a citizen?
Q. Can your rights be restricted in a given circumstance?
Q What are the fundamental rights granted to citizens?
Q What could be the fundamental rights of a human being?

2. Identification of key words / points

- Citizen's Fundamental rights, Indian constitution
    - Right to Equality

- Right to Freedom
- Right against Exploitation
- Right to Freedom of Religion
- Cultural and Educational right
- Right to Constitutional remedy

- Fundamental Rights· Seizure, withdrawal, amendment-power of judiciary, legislature
- Citizen's fundamental right, other countries
- Human rights, protection, violation
- Children's right, protection, violation
- Commission / organization / association for Human rights (National & International)
- Rights minorities, refugees

Q. Do children have any right?
Q. What is about the right of minorities, refugees in a country? In India?
Q. Are the fundamental rights enjoyed properly? Any violation?
Q Is there any one to protect the fundamental right? How does it protect?

It is worth mentioning that the discussion does not intend to extract any answer, from pupils rather to draw the attention of pupils to the dimensions of the topic (Fundamental Rights). Such questions and the accompanying discussion stimulates some urge among pupils to know more about fundamental rights and to synthesize the information into some product such as: an essay, a report, a data base, an action plan a concept map presentation and hypermedia product At the end of the discussion the teacher facilitates students' decision making about (i) what dimension they want to explore on Internet? and (ii) How can they synthesize the vast information so gathered ?

B. Internet Based Activities

(i) Information Exploration

The students are divided into 5-6 groups with 4-5 students in each group Each group is assigned a dimension of the topic previously identified during pre-internet activity stage. After that each group locates the information at various websites by directly searching the key points. The teacher may suggest some important website such as.

- www.hrcr.org
- http://Law.gsu.edu
- www indianchild.com
- www.indiaserver com
- http://indiacode nic/coiweb/coifiles/pos.htm

(ii) Selection of Appropriate Information

The information thus collected will be examined by the pupils in terms of their applicability, authority and reliability Only the relevant and reliable information will be gathered.

C. Extended Activities

Each group collects additional information on 'fundamental rights' from other sources like local public libraries, school libraries, newspapers, television channels, institutions / agencies working in the locality and teachers as well members of each group sit and share their views and thoughts regarding the gathered information. The aspects which could / couldn't be explored will be pointed out. Then the work is to be consolidated in the form(s) of essay, report, database, hypermedia text material, power point presentation etc. The teacher extends help to the group so that the group makes a good synthesis of the gathered information, the experience and the opinion of the group members.

4. Presentation and Evaluation

Each group makes power point presentation of the outcomes of the group work before the whole class. The students across the groups are free to raise questions and give suggestions. The performance of the group is assessed using some kind of grading rubric The teacher takes care of the entire process to ensure that students find answers to the basic questions raised during the pre-internet activity stage.

5. Discussion

The teacher may put the following questions before the class for discussion

(i) What sources did you use to find information?

(ii) Which one is best to use?

(iii) What problems did you face during various phases of teaching-learning, e.g. pre-internet, internet, extended activities?

(iv) What techniques did you adopt to synthesis?

(v) What else would you like to explore on 'Fundamental rights'?

LESSON PLAN NO.2

Grade Level : IX
Subject : Biology
Topic : Ecosystem
Duration : 3 days

1. Expected Learning Outcomes

(i) Students use internet, digital encyclopedia, dictionaries, CD Roms, Video cassettes, books and other print materials to gather information on ecosystem;
(ii) Students collect the information and synthesize them into a report on 'Ecosystem'
(iii) Students understand the various components of ecosystems and the intimate relationship among them
(iv) Students know the contemporary ecological crisis and builds up their own perception on ecosystem and ecological problems.
(v) Students learn from each other about the lesson
(vi) Students make a PowerPoint presentation of their learning outcome.

2. Overview of the Lesson

Ecosystem is a self-sustaining structural and functional unit of biosphere. It is an open system and depends upon solar energy from outside as its energy source. Ecosystems can be small or large. Between adjoining ecosystems there is frequent exchange of material and energy Thus they are all interconnected and interrelated.

An ecosystem consists of two major components· abiotic and biotic The abiotic components will comprise of (i) Inorganic substances (ii) Organic compounds and (iii) Climatic factors. The biotic factors comprise of (i) producers (ii) consumers and (iii) the decomposers. The producers and the consumers are interconnected as chains where energy transfer occurs from one end to another. An ecosystem has two functions viz: (i) energy movement (ii) nutrient movement (The major nutrient elements i.e. carbon, hydrogen, oxygen and nitrogen). The solar energy is transformed into chemical energy (through photosynthesis) which finally is converted to mechanical energy (work done) and heat This energy flows from the sun through producers to consumers happen in a single direction only But the flow of nutrients between the living and the non-living components of the ecosystem is a cyclic process. Examples are the carbon and the nitrogen cycle.

There are two main types of eco-systems, namely (i) terrestrial, and (ii) aquatic. Each ecosystem has its unique combination of a variety of organisms and physical conditions. In terrestrial ecosystem, based on the dominant vegetation (grass, tree etc) and other climatic factors, several further types are recognized, such as grassland, forest, desert, man-made ecosystems such as agricultural ecosystems etc Aquatic ecosystems also can be distinguished into several types depending upon the salt of water. These can be fresh-water ecosystems, river ecosystem and marine ecosystems

3. Teaching-Learning Activity

A Pre-Internet Activity

(i) Formulation of the Learning Task

The teacher draws the attention of students to a common issue of ecological imbalance, which they experience intensely (for example decreasing population of certain species of animals and birds and its effects on others) in the form of an informal discourse. Such informal discourse can pull selected issues of eco-disturbance and aims at generating a passion among students to know more about ecosystem. This would expose the student to the task of learning? What are they to learn about? The teacher may use the following thought stimulating questions:

Q. How are the plants, the herbivorous animals and the carnivorous animals inter connected?
Q What would happen if such 'togetherness', 'mutual dependence' collapse?
Q. How do we conceive an ecosystem?
Q What are the components of an ecosystem?
Q. What are the various types of ecosystems?
Q. What way the ecological balance is disturbed?
Q. How are the different ecosystems in land and in water? How are they disturbed these days?
Q What implications do the ecological imbalance put forward for us?
Q. Is there any step initiated to sustain ecosystem?

(ii) Identification of key words

Basing upon the discussion made the teacher ensures that the following key words and dimensions of the topic 'Ecosystem' emerge These words are arranged into related groups building the various dimensions of ecosystems; and serve the starting points for Internet activities (exploration and information collection)

- ❖ Ecosystem. Components, abiotic, biotic structure, dependence of components.
- ❖ Ecosystem. Types, Terrestrial, Aquatic, Forest, Desert, Agricultural; Freshwater. River water, Marine ecosystem
- ❖ Functions of eco-system: Energy Transformation, Nutrients recycle

- Ecological Imbalance· Implications, Impact
- Restoration of Ecosystem, Organization, Institutions working for restoration of ecosystem

B. Internet Based Activities

The activities at this stage must be group-based. The class will be divided into small groups consisting of 3-4 members. Each group will be assigned a task from those identified during the pre-internet activities The main activities consist of exploration and selection of information.

(i) Information Exploration

The teacher may suggest some important websites such as·
http·//www.physicsforum com
http://www.scipub.net/environmental-science/ecology-ecosystem-biosphere-environment-sciences html
http.//www.botos.com/marine/antarctic01.html
http://www.rpi.edu/dept/chem-eng/Biotech-Environ/ECOLOGY/project.html
http://www.globalchange.umich.edu/globalchange1/current/lectures/kling/ecosystem/ecosystem html

(ii) Selection of relevant Information

While searching out the required information, students critically examines the web pages in terms of the applicability of the information, authority of the information, reliability of the information. Only relevant authentic and reliable information is gathered by the student groups in the assigned areas of the topic.

C. Extended Activities

Additional information from non-internet sources such as Digital Encyclopedia, Video CDs, Television and texts and print media are identified and gathered. Where ever it require the groups seeks the assistance of the teachers and available experts in the locality After that the members of each group sit and share their views and thoughts regarding the gathered information Then each group synthesizes the collected information in the form(s) of essay, report, database, hypertext material, power point presentation The teacher extends help to the group so that they make a good synthesis of gathered information, experience and their opinion.

4. Presentation and Evaluation

Each group makes power point presentation of the outcomes of the group work before the whole class. All students are free to raise queries, observations and opinions The teacher fine tunes the process so that the class finds answers to the basic questions during the pre-internet activity stage The performance of the group is evaluated on a suitable grading tool.

5. Discussion

Students share among themselves their experience about the whole process of Internet based learning. The teacher may open up the discussion with the help of the following questions.

I. What sources did you use to find information?
II. Which one(s) are best to use?
III. What problems did you face during various phases of teaching-learning, e.g. pre-internet, internet, extended activities?
IV What techniques did you adopt to synthesize the gathered information?
V. What else would you like to explore on 'Ecosystem'?

LESSON PLAN NO.3

Grade Level	:	IX
Subject	:	Language (English)
Topic	:	My Childhood
Duration	:	Two days

1. Expected Learning Outcomes

(i) Students use various forms of writing to express their thoughts.
(ii) Students learn to work together.
(iii) Students relate the messages of literature to their own experience.
(iv) Students understand the social realities, particularly with reference to religion and caste.
(v) Students develop their own thoughts
(vi) Students give their love to parents, teachers and elders.
(vii) Students create a multimedia presentation to convey their understanding of child

2. Overview of the Lesson

The lesson "My Childhood" is an autobiography of A P.J. Abdul Kalam, an eminent scientist of the world and the present President of India. The author, in his writings, has aptly described his experiences on some of the social realities during his childhood days, i e. in the middle of the 19th century Being a Muslim, Kalam had closest friends from orthodox Hindu Brahmin families. He has narrated his mixed experiences of love and hatred, particularly from the side of the elders including the teachers The experiences of deepest love from friends belonging to orthodox Hindu Brahmin families; love and encouragement from teachers; and noble deeds and faith of parents, have left some indelible marks in his mind. All these have significant influence in shaping his thought and deeds.

The students after going through this writing would be tempted to protest against discrimination based on social barriers such as untouchability, religionism, communalism; and develop their own thoughts so as to contribute to the development the nation. Ultimately, students will demonstrate what they have learned by creating a presentation.

3. Teaching-Learning Activities

A. Pre-internet Activity

At this stage the main business of the teacher is to facilitate formulation of tasks and identification of key points within the tasks These activities are performed with the class as a whole.

(i) Formulating the learning tasks

The teacher, in order to explore the main tasks within the lesson, initiates discussion by asking the following questions.

- What are your aims of life?
- What made you set your aims?
- Why do you like your closest friend?
- What can you do for your country?
- Describe your community on the bases of language, religion, caste, economic, status of the people living?

The following dimensions may emerge out of the above discussion

- A.P J Abdul Kalam as a Scientist
- A P J Abdul Kalam as a Leader
- A.P.J Abdul Kalam as a Man
- Life events

- Qualities that made Kalam a national character
- Socio-cultural set-up in which Kalam was brought up
- Parental contribution
- Hobby / Habits
- Literary works

(ii) Identification of key words/points?

The following words/phrases would help in searching information on different aspects of the lesion

- ➢ Autobiography
- ➢ Scientist
- ➢ Autobiography of scientists
- ➢ Life history of scientists
- ➢ Life history of states men
- ➢ Social structure
- ➢ Casteism
- ➢ Religionism
- ➢ Communalism
- ➢ Second world war
- ➢ Gandhiji
- ➢ Freedom movement

B. Internet-Based Activities

The activities at this stage must be group-based. The class will be divided into small groups consisting of 3-4 members. Each group will be assigned a task from those identified during the pre-internet activities. The main activities consist of exploration and selection of information.

(i) Exploration of Information

Teacher gives the names of the following websites and asks each group to collect information on the task assigned.

http://www.worldwidewebfind.com/encyclopedia/en/wikipedia/a/ab/abdul_kalam.html
http://www worldwidewebfind com/encyclopedia/en/wikipedia/1/19/1998 html
http.//news.bbc.co uk/1/hi/world/south_asia/2135439.stm
http://www.abdulkalam.com/
http://presidentofindia.nic.in/
http //www.icbs com/IIT/abdul-kalam-speech htm
http://www sulekha.com/expressions/column asp?cid=305892
http://www mouthshut.com/readreview/32125.html
http.//www.nationmaster com/encyclopedia/APJ-Abdul-Kalam

(ii) Selecting Appropriate Information

The information collected by each group are scrutinized so as to retain only information that are reliable, valid and usable

C. Extended Activities

The teacher suggests the following books written by Kalam for further readings:

- Wings of Fire
- My vision of India – 2020

The students are also suggested to collect writings, speeches of Dr. Kalam from library, news articles and other sources.

The materials collected from various sources including those from internet will be synthesized in the form(s) of report or essay.

4. Presentation and Evaluation

Each group makes a Power Point presentation of its outcomes before the whole class. Students may make queries, express their observation, supplement or substantiate to the presentation. The performance of the group is evaluated on a suitable grading rubric.

5. Discussion

Students make discussion among themselves pertaining to the issues they faced during the course of their activities at different phases of learning. The teacher initiates discussion with the help of the following questions:

- What sources did you use to collect information?
- Which source(s) did you find most useful?
- What problems did you face during various phases of teaching-learning, e.g. pre-internet, internet, extended activities?
- In which aspects of the lesson did you not find materials?
- What new aspects do you suggest for this lesson?

Lesson plan No - 4

Grade level : IX
Subject Economics
Topic : Agriculture and India Economy
Duration : 3 days

1. Expected Learning outcome

(a) Students utilize various information sources like internet, other digital and analog information sources – CDs, video tapes / cassettes and the non-electronic sources of information on the topic 'Agriculture, and India Economy (After Independence)'.

(b) Students understand the importance of agriculture in Indian economy, development of agriculture after independence

(c) Students collect and compile various information, such as: growth in agricultural production, consumption, export, import, growth of agro-industries etc to understand the economic growth after independence in India.

(d) Students collect information about the influence of liberalization and globalization on agro-economy of the county.

(e) Students learn from each other about the lesson.

(f) Students make a power point presentation of their learning outcome.

2. Content overview

Agriculture occupies an important role in Indian economy About 70 percent of the Indian people earn their livelihood from this sector. Agriculture provides food to the growing Indian population. After independence there has been a substantial growth in food production Total production of food grains was about 53 million tones in 1949-50 and it rose to 89 million tones in 1964-65 and further to 209.8 million tones in 1999-2000. The yield per hectare has also increased during the plan period. For example in the case of wheat, the yield per hectare was 6 6 quintals in 1949-50 and it increased to 9.1 quintals in 1964-65 and further to 27.8 quintal in 1999-2000. The rate of growth of yield per hectare for all types of food grains was about 1.4 per cent per annum during 1949-50 to 1964-65 and it increased to 2.4 percent per annum from 1964-65 to 1996-97. Both the production and area of cash crops have increased during the plan periods. Increased in cash crops such as jute, cotton, oilseeds, sugarcane, tobacco, rubber, tea, coffee cocoanut etc strengthen many agro-based industries. Indian agriculture also plays an important role both in the internal and external trade of the country. Internal trade in food grains and other agricultural products helps in the expansion of service sectors (e g. agricultural market, agricultural credit, transport services required for carrying these products from one region to another etc). India gains foreign currency by exporting agricultural products like cashew nuts, raw cotton, tea, coffee, tobacco which constituted 50% of our export income during the first decade of our planning (i.e.1951-61) Thus commercial crops (such as cotton, jute), plantation crops such as tea, coffee, natural rubber) horticulture crops (such as fruits, vegetables, medicinal plants, spices etc) occupy an important place in Indian export. Recently flower cultivation has been identified as an important focus area for export promotion.

Indian agriculture also occupies an important place in the central and state budgets For instance the plan outlay of centre and state governments for the development of agriculture and allied sectors remained about Rs.1,089 crores during third five year plan (1961-66); and this amount had increased to about Rs.42,462 crores during the ninth five year plan (1997-2002). Collection of land revenue by the state governments, freight charges imposed by Indian railways for carrying agricultural products etc generate revenue to the government exchequer. Several institutional and technical reform policies introduced by the government during the plan period to improve Indian agriculture have certainly generated some positive impact on this sector However, the average productivity of Indian agriculture is still far below compared to some of the developing and developed countries of the world. The liberalization of world trade in agriculture and the phenomenon of globalization have brought forth new vistas of growth potentials and new challenges to Indian economy

3. Teaching-Learning Activities

(a) Pre-Internet Activity

(i) Formulation of the learning task

With an intension of flare up curiosity and motivation among the students to know about 'Agriculture and Indian Economy' the teacher initiates a discussion. The group of students facilitated by teacher will formulate a few specific dimensions of the topic on which the students will search information and learn the topic on their own. The teacher may use the following questions:

Q1. What is the place of agriculture in Indian Economy?

Q2. What steps have been taken to promote agricultural sector during the various plan periods?

Q3. What has been the position of Agricultural production and consumption since independence?

Q4. What are the various agro-based industries? Which states of our country leads in which industries?

Q5. What has been the position of agricultural export and import of Indian as compared to other countries of the world?

Q6. What are the major issues and problems, which affects adversely Indian agriculture?

Q7. What are the impact of globalization and liberalization on the agricultural economy of India?

(ii) Identification of key words / phrases.

Discussion in the task formulation stage will open up the various aspects of the topic of learning They teach steers the session in such way that a series of key words / phrases representing the various aspects of the learning task is generated. These words will be the search items on the Internet and in the other information sources. A few specimen key words / phrases could be.

Agro-based Economy;
Agriculture and Economic growth;
Indian economic planning and Agriculture;
Food Production, Food consumption;
Agro-Industries: Growth, major issues; Agricultural export and import : comparative positions,
Globalization, liberalization and Indian economy Impact on Agriculture sector, major issues / problems of the agriculture sector in India and so on

Students arrange them into psychologically and logically meaningful clusters in some orders. This in the later stages will guide the information searching, selecting, synthesizing and documenting in a systematic way.

(b) Internet Based Activity

(i) Exploration of Information

Students are divided into small groups of 3-4 in each Each group searches the key words as assigned or chosen on the Internet to explore information about the topic. They may use their own strategy and search engines at random such as yahoo, google altavista etc. The teacher may suggest specific websites on the various aspects of the topic 'Agriculture and Indian Economy (After Independence)'

http://www.apeda.com/html/agriculture.html

http.//www.expressindia com/fullstory.php?newsid=36973
http.//www punjabheritage com/eco1.htm
http://inhome.rediff.com/money/2004/sep/09binter htm
http://india_resource.tripod.com/quality.html
http://india_resource.tripod.com/infra.html
http://www economywatch.com/database/agriculture htm
http://www.cddc.vt edu/knownet/vikas-investment pdf
http://www punjabilok com/agriculture/impact_ecoref1 htm

(ii) Selection of Appropriate Information.

Each group scans the identified web pages, scrutinizes and filters the information gathered. The relevant information and data will be recorded into a data organizer dimension wise. This is an important phase of internet based learning demanding lots of meta-cognitive competencies.

(c) Extended Activities·

Each group then proceeds to identify and scan other sources of information beyond Internet on the chosen / assigned dimension of the topic. These sources could be library, subject experts, NGOs, Research Institutions, teachers, video cassettes, CDs etc

4. Presentation and Evaluation:

All the relevant information collected from the internet and other sources will be synthesized and organized by each group. Each group may prepare data base(s), graph, charts, photo-albums, action plans, reports etc. as it would be appropriate to their chosen / assigned dimensions Views of each member of the group is taken into consideration Then each group makes power point presentation on the topic before the entire class The teacher and the students evaluate the group performance on suitable grading tools Thus the whole class learns on the topic and construct their own conceptions and perceptions of the topic

5. Discussion

Finally all students discusses the following to reflect upon their process of internet based learning:

- What sources did you use to collect information?
- Which source(s) did you find most useful?
- What problems did you face during various phases of teaching-learning, e g. pre-internet, internet, extended activities?
- In which aspects of the lesson did you not find materials?
- What new aspects do you suggest for this lesson?

Lesson Plan No - 5

Grade Level : IX
Subject Geography
Topic Global Warming
Duration : 3 days

1. Expected Learning Outcomes

(a) Students use various learning resources such as Internet, other digital and analog information sources – CDs, video tapes / cassettes and the non-electronic sources of information to explore, information on the topic 'Global warming'

(b) Students understand the phenomenon of global warming, its causes and the impacts of global warming, the need to protect the atmosphere.

(c) Students are affectively aroused towards the implications of global warming and develop action initiatives and moral support towards protection of the atmosphere

(d) Students learn from each other about the lesson.

(e) Students make a power point presentation of their learning outcome.

2. Content Overview

Global warming refers to the rise in average mean temperature of the earth on account of anthropogenic emissions in atmosphere. Recent studies have shown that mean temperature at global level of the quarter June – August, 2002 was above that of the period 1988 – 2002 The temperature was 0 47^{0}c above the long-term mean. However, in Argentina, central Russia and Japan it was lower than the earlier average temperature. Global surface temperature in 2000 was 0.39^{0}c to 0.6^{0}c above the long-term average of the period 1880 to 1999. Further the year 2002 was also the sixth warmest year on record. For the century as a whole the temperature has increased at a rate of 0.6^{0}c

During the 20th century there was two sustained periods of warming one between 1910 and 1945 and another beginning about 1976 and continuing upto this day All these findings confirm that global warming is a reality

The rate of increasing in temperature is expected to rise further Much worse are its consequences –

(i) Below normal precipitation in Africa and Gulf coast United States.

(ii) Above normal precipitation in the tropical Indian ocean, Indonesia and the tropical pacific ocean

(iii) Some areas may not experience any rainfall at all

These changes in rainfall pattern are expected to lead flooding in some areas, drought in others. Monsoon flooding is expected to cause great loss of life in India, Bangladesh and South East Asian countries. Over the last 100 years because of global warming the ice reserves have melted and the sea level has risen by about 10 to 25 cm. If this trend continues some areas will be submerged under water.

Some of the chief causes of global warming are:

(i) Destruction of ozone layer through CFCs (Chiro-Floro-Carbon) substances, nitrogenous oxides used in fertilizers and the emissions from industries, road and air transport

(ii) Blocking of terrestrial radiation through green house mechanism

(iii) Large deforestation imbalancing the eco-systems

Global warming will bring forth serious threats of rise in sea level, precipitation change, radiation imbalance, agricultural setbacks, disturbed water resources and diseases. Ultimately the life forms, the landforms and the water bodies will be questioned for its continuity.

3. Teaching-Learning Activities

(a) Pre-Internet Activity:

(i) Formulating the learning task

The teacher initiates a discussion with a view to opening up the topic of learning, 'Global warding' the teacher's intension is to build up curiosity and motivation among students for formulating the different aspects of the topic on which they are supposed to learn by exploring information themselves. He may use questions like:

Q1. Is it a reality that the global temperature is on the rise?
Q2. Any study available on the pattern of temperature rise?
Q3 Why and how global warning is caused?
Q4. How are we concerned with global temperature rise?
Q5 How is the climatic conditions affected by global warming?

(ii) Identification of key words / phrases

The students in the first phase of the pre-internet activity forms the ideas about the various aspects of the topic on which they have to collect information for won learning. Such discussion generates many key words / phrases which will be the search items on the Internet The teacher ensures that students identifies the words like·

Global warming, studies on global warming, causes of global warming, climatic changes due to – Green house effect, terrestrial radiation, impact on life and landforms etc After this students arrange them into meaningful clusters on some orders This guides the information searching, selecting, synthesizing and documenting in a systematic way

(b) Internet based activity:

(i) Exploration of Information

Students are divided into small groups with 3-4 students. Each group of students searches the key word as assigned on the internet to explore information on global warming. They may use their own strategy and random search engines such as Altavist, Google, Yahoo etc The teacher may suggest some websites on the various aspects of Global warming such as:

http://www solcomhouse.com/globalwarming htm
http //www.keepmedia.com/featuredtopics/GlobalWarming?extID=10038
http://www keepmedia com/pubs/HealthDay/2004/03/22/404363?nbdTopicID=42
http://tropicaltreefarms com/
http://www nrdc.org/globalWarming/f101 asp
http://www.globalchange.com/berry.html
http://www.news-miner.com/Stories/0,1413,113~7244~2426657,00.html
http://www.sartma.com/art_1140 html

(ii) Selection of Appropriate Information

Each group scans the identified web pages, scrutinizes and organizes the gathered information. The relevant information and data are recorded into a task organizer dimension-wise This is an important phase of Internet based learning demanding lots of meta-cognitive competences

(c) Extended Activities

Each group then proceeds to identify and scan other sources of information beyond Internet on the chosen / assigned dimension of the topic 'Global warming'. These sources could be library, subject experts, NGOs, Research Institutions, teachers, video cassettes, CDs etc

4. Presentation and Evaluation

All the relevant information collected from the internet and other sources will be synthesized and organized by each group Each group may prepare data based, graph, charts photo-albums, action plans, reports etc. as it would be appropriate to their chosen / assigned dimension. Views of each member of the group is taken into consideration. Then each group makes power point presentations on the topic 'Global warming' before the entire class. The teacher and the students evaluate the group performance on suitable grading tools. Thus the whole class learns on the topic and construct their own conceptions and perception of the topic.

5. Discussion

Finally all students discusses the followings to reflect upon their process of Internet based learning:

(i) What websites did you browse to search out the information?
(ii) What strategies did you follow to filter out the irrelevant and non-essential information?
(iii) What typical experiences did you gain during the Internet search and during their work with other sources of information?
(iv) What dimensions, you wanted but could not learn about?
(v) What problems did you face during various phases of teaching-learning, e g pre-internet, internet, extended activities?

CHAPTER –IV

FUNDAMENTALS OF INTERNET

4.0.0. OBJECTIVES

This module of Internet will enable you to know:

4.1 0 The Architect and Functioning of Internet with its Historical Development,
4.2 0 How to Search the Internet;
4.3.0 How to use E-mail,
4.4 0 How to Develop a Web Page

4.1.0 Architect and Functioning of Internet with its Historical Development

The U S Department of Defense laid the foundation of the Internet roughly 33 years ago with a network called ARPANET. But the general public didn't use the Internet much until after the development of the World Wide Web in the early 1990s. As recently as June 1993, there were only 130 Web sites. Now there are millions Some important events in connection with the development of Internet are discussed as follows

4.1.1 Formation of ARPANET

In 1957, the U.S. government formed the Advanced Research Projects Agency (ARPA), a segment of the Department of Defense charged with ensuring U.S. leadership in science and technology with military applications In 1969, ARPA established ARPANET, the forerunner of the Internet

ARPANET was a network that connected major computers at the University of California at Los Angeles, the University of California at Santa Barbara, Stanford Research Institute, and the University of Utah. Within a couple of years, several other educational and research institutions joined the network

In response to the threat of nuclear attack, ARPANET was designed to allow continued communication if one or more sites were destroyed. Unlike today, when millions of people have access to the Internet from home, work, or their public library, ARPANET served only computer professionals, engineers, and scientists who knew their way around its complex workings

4.1.2 Emergence and Control of World Wide Web

The World Wide Web came into being in the year 1991, by Tim Berners-Lee and others at the European Laboratory for Particle Physics (CERN) The team created the protocol based on hypertext that makes it possible to connect content on the Web with hyperlinks.

At the beginning, the Internet was limited to noncommercial uses because its backbone was provided largely by the National Science Foundation, the National Aeronautics and Space Administration, and the U S. Department of Energy, and funding came from the government. But with the development of independent network, users could access commercial Web sites without using the government-funded network By the end of 1992, the first commercial online service provider, Delphi, offered full Internet access to its subscribers Several other providers appeared gradually.

In June 1993, the number of web sites were limited to 130. By a year later, the number had risen to nearly 3,000 By now, there exists millions sites on the Web. No one authority controls the World Wide Web Today's Web site authoring tools allow virtually anyone who has access to a computer and the Internet to post a Web site and contribute to the definition of what this medium is and what it can do. But the World Wide Web Consortium does oversee the development of Web technology

4.1.3 The World Wide Web Consortium

Keeping an eye on the standards of Web technology W3C is formed by Berners-Lee in 1994 An international group of industry and university representatives, (W3C) promotes the Web by developing common protocols for transmitting information over the Internet The consortium provides information, reference code, and prototype and sample applications to developers and users. It is hosted by the Massachusetts Institute of Technology's Laboratory for Computer Science in the United States, the Institut National de Recherche en Informatique et en Automatique in Europe, and the Keio University Shonan Fujisawa Campus in Japan.

4.1.4 Fundamentals of Internet

Knowledge and understanding of some terms, symbols and concepts are prerequisites to acquire functional knowledge about the use of Internet and e-mail These are described in brief as follows.

A) Domains

Domains divide World Wide Web sites into categories based on the nature of their owner, and they form part of a site's address, or uniform resource locator (URL). Common top-level domains are:

- **.com**—for commercial enterprises
- **.org**—for nonprofit organizations
- **.net**—for networks
- **.edu**—for educational institutions
- **.gov**—for government organizations
- **.mil**—for military services
- **.int**—for organizations established by international treaty

- **.biz**—commercial and personal
- **.info**—commercial and personal
- **.name**—for personal sites

Additional three-letter, four-letter, and longer top-level domains are frequently added. Each country linked to the Web has a two-letter top-level domain, for example .fr is France, ie is Ireland.

B) The Internet and the Web

The Internet and the World Wide Web are closely related but not the same.

- The Internet is a decentralized global network of computers.
- The Web is a collection of documents, or Web sites, that you can access using the Internet and your Web browser software. The Web comprises the vast majority (but not quite all) of the content available over the Internet

Web sites reside on computers called Internet servers. When you're connected to the Internet, your Web browser software can communicate with Internet servers, asking them to send to your computer a copy of the Web page you'd like to see. The uniform resource locator (URL) you type or the hyperlink you click tells your computer which server to try to contact and which page to ask for.

C) Transmisson Control Protocol \ Internet Protocol

The interconnected computers of the Internet are of different types, and they use different operating systems. To communicate with each other over the Internet, they use a common set of rules called Transmission Control Protocol/Internet Protocol (TCP/IP) or just Internet protocol (IP). TCP/IP software allows your computer to connect to the Internet, too

D) Internet besides the Web

Many types of information are accessible over the Internet. Here are some things, in addition to visiting Web sites, that you can do using the Internet:

- Send and receive electronic-mail messages
- Join in a Usenet newsgroup
- Transfer documents and programs between your computer and FTP, or file transfer protocol, sites.
- Use a Gopher to locate information on other sites.

E) Frequently asked Questions (FAQ)

FAQ stands for "frequently asked questions " Many sites on the World Wide Web include a FAQ, which answers common questions about the site, such as what it covers, how to find information on it, and who created it. Typically, a FAQ will be in the form of a text document you can download, rather than a full-fledged Web site. When you visit a newsgroup for the first time, look for its FAQ It will probably answer all of your questions about the newsgroup and can help you get the most out it.

F) Newsgroups

Usenet newsgroups are Internet discussion groups on just about any topic you can imagine There are more than 50,000 newsgroups, and more are added all the time. Each newsgroup covers a particular topic, often alluded to in its name A newsgroup creates a discussion string, or series of related messages Each message responds to an earlier message or addresses the overall newsgroup topic in some way. You can post your own message in response to the messages that interest you most. Some examples of news groups are as follows.

- sci.physics.fusion
- soc.genealogy.hispanic
- rec.arts animation
- alt.autos.antique

You can find newsgroups that interest you by searching for them on the Google com Web site. Google.com is a good place to learn more about newsgroups in general If your e-mail client is also a newsreader, you can use it to subscribe to, read messages from, and post messages to newsgroups. Microsoft® Internet Explorer version 6 0 makes newsgroup access easy, too. On the Go menu, simply select News. Internet Explorer 6.0 automatically launches Microsoft Outlook® Express and opens your newsgroups folder so you can get down to business. In order to join a news group discussion proceed as follows.

- Read a newsgroup's FAQ first to learn more about the group.
- Check whether the newsgroup has a file containing its charter and rules If it does, read this before you post messages.
- Read a good portion of a discussion string before joining in Others in the discussion will appreciate that you took the time to get familiar with the conversation first.

G) Usenet, FTP, and Gopher

Usenet, FTP, and Gopher represent ways of accessing information other than Web sites over the Internet.

- **Usenet**—a collection of several thousand newsgroups on just about any topic Using a newsreader, you can subscribe to a newsgroup, read the messages other subscribers have posted, and post your own messages in response. Newsgroups provide a way for users to share information about topics that interest them The Deja.com Web site provides an introduction to newsgroups and a way to search them.

- **FTP**—stands for "file transfer protocol," a system of rules and a software program that allow you to log on to another computer and transfer information between it and your computer Most browsers have some FTP capability built in You can find many FTP sites using a regular Internet search engine, or use the Archie search engine, which indexes FTP sites
- **Gopher**—a simple menu system that you can use to connect to files on the Internet. This easy-to-use system introduced many users to the Internet before the World Wide Web became popular Using the University of Minnesota's Gopher, which was the first Gopher, you can connect to Gophers worldwide. You can search Gophers using a program called Veronica.

H) The Basics

There's more than one way to access the World Wide Web. Many people browse the Web from their desktop computer with the help of a modem and telephone line. But you can get Web content in other ways, including through your television, at cyber cafes, at many libraries, at some airports, and even in your car. First, let's learn about your Internet service provider (ISP). If you already know the basics of getting online from your PC, you can jump directly to Getting Online Wherever You Are.

I) Choosing an Internet service provider

An Internet service provider gives you the telephone access and software you need to connect to the Internet, along with some technical help. Many ISPs also include an electronic-mail account, host customers' Web pages, and offer services to companies that do business on the Internet. You can choose from local and national ISPs

J) Types of Internet Connections

There are many ways to connect to the Internet: dial-up modem, broadband cable, Digital Subscriber Line (DSL), satellite broadband, Integrated Services Digital Network (ISDN), and T-lines. Not all types of connections are available in every geographic area, so your selection may be limited to what local providers offer. Here is some information to help you make a choice. If you already have chosen a connection for your home use, check out your options

- Modem/Dial-Up Connection
- Broadband Cable
- DSL
- Satellite Broadband
- ISDN and T-Line
- Wireless—The Next Step

(i) Modem/Dial-Up Connection

This is the most common method of connecting to the Internet. Because dial-up modems run over normal telephone lines, they provide Internet access to virtually everyone. While you're online, though, your phone is unavailable for calls, so some people install a second line for their computer. Modems can be external or internal. Many new PCs come with a modem built in, so all you have to do is connect a modular telephone cable to the back of your PC, set up an account with your Internet service provider (ISP), and log on. Your ISP will give you the telephone number to use for your area, the settings you need, and the software on CD-ROM to install on your computer. The speed of this type of connection ranges from 14 kbps to 56 kbps and usually the slowest.

(ii) Broadband Cable

Cable modems connect you to the Internet through your cable TV line. Many cable companies now offer Internet as well as TV accessibility. This not only gives you faster Internet content and graphics and better streaming audio, video, and multimedia, but you also get added interactivity with your TV. The speed of this type of connection is much faster – 1000 kbps download, 128-500 kbps upload.

(iii) Digital Subscriber Line (DSL)

There are several forms of Digital Subscriber Line that works at varying speeds and distances from the nearest telephone substation Call your local phone company or ISP, and ask what's available for your location. DSL can increase your connection speed by as much as tenfold from a standard dial-up modem. It operates over normal telephone lines and can be used simultaneously with the telephone. And there's no limit on how long you're connected. The speed of this type of connection ranges from 354-1000 kbps, depending upon the type of DSL and the distance from the nearest station.

(iv) Satellite Broadband

Two-way satellite broadband service transmits high-speed data via satellite to a dish antenna. With one-way satellite, you need a conventional modem and telephone link to an ISP for uploads, but the newer two-way satellite systems allow you to download and upload through your satellite dish It's expensive but sometimes is the only fast option for people who are beyond the service area of cable and DSL providers. An unobstructed line of sight to the south is required to aim the satellite dish The speed of this connection is 400 kbps download and 128 kbps upload

(v) ISDN and T-Line

ISDN and T-lines are more common in business and commercial use. Several newer apartments and condos in major metropolitan areas offer these connections as a built-in, value-added service for their residents.

ISDN. ISDN stands for Integrated Services Digital Network Digital connections have fewer errors in transmission, which means you can download graphics, Web pages, sound, and multimedia up to four times faster than with dial-up modems. A single ISDN line can handle up to eight devices, including a PC, telephone, fax, and video, and you can have any two devices operating simultaneously ISDN operates over standard telephone wires and fiber optic circuits, meaning it's readily available. Speeds are around 128 Kbps (up to 1,000 Kbps with compression),

T-line. The T-carrier system is a direct link to the Internet. T-lines are very expensive and are usually used by ISPs to provide subscribers with Internet access or by businesses that want to set up point-to-point private networks.

(vi) Wireless-The Next Step

Wi-Fi. Once the IEEE 802.11b standards for wireless communication were established, wireless Internet wasn't far off. By adding short-range radios to stationary computers, laptops, and handheld personal digital assistants (PDAs) like Pocket PC, you can exchange data at rates up to 11,000 Kbps over distances from several hundred feet indoors to 10 miles outdoors without wires! Large businesses and hospitals immediately starting using the longer-ranger systems, called Wi-Fi, for inventory, file sharing, business records, and e-mail.

The most recent advance in this technology, Wi-Fi 5 raises processing speeds to 54,000 Kbps, enabling faster access. Once restricted to shades of gray, screens are now in color Wireless connections are popping up in hotels, cafes, and airports. With a properly equipped laptop or PDA, you can be online almost anywhere. Just make sure you follow your system's security instructions to prevent someone from listening in.

Bluetooth. Bluetooth is a technology with a range of only 30 feet and a slower connection speed of 720-1,000 Kbps, making it well suited to homes and small offices. Connecting to the Internet through cell phones and PDAs is available now as well, though the small screen size of PDAs sometimes makes it difficult to view large, intricate Web pages It's best for quick checks of the weather, news, traffic, sports, and other easily digestible pieces of Internet content.

4.2.0 How to Search the Internet

Once you get connected to the Internet, you need to know how to find the World Wide Web sites and newsgroups that interest you. You may find, as many people do, that it's fun just to wander—or surf—from site to site, going wherever the links take you. But if you want to find something specific and find it as soon as possible, you need to use a search engine. Below you'll find information on how to find the search engine and newsgroups that suit your needs

4.2.1 Use of Search engines

A search engine is a service that indexes, organizes, and often rates and reviews Web sites. It helps you find what you're looking for in the Internet haystack. Different search engines work in different ways:

- Some rely on people to maintain a catalog of Web sites or pages.
- Some use software to identify key information on sites across the Internet
- Some combine both types of service.

No search engine keeps track of all the content on the Internet So try several search engines to see which produce the most useful results for the types of information you usually look for. Whenever a search fails to produce the results you want, try another search engine. A brief introduction about some major search engines are given as follows.

- **MSN Web Search** Using this search page, you can conduct a basic Web search or an advanced search, specifying one or more of the following· the type of information, the language, the origin, the domain, the date created, and the types of files contained in the Web page
- **AltaVista**. At AltaVista, you can search for keywords or type your query in the form of a question. Other features include Babelfish, which translates sites in several languages; Photo & Media Finder, which searches for images; and Family Filter, which helps you limit the types of results produced by the search
- **Infoseek**. Infoseek's search engine boasts an extensive catalog of sites. Infoseek has a directory, too, that categorizes sites by topic using software. Some sites have been reviewed and are recommended
- **Lycos**. Like Excite and Infoseek, Lycos is a search engine with a directory, organized by subject
- **Snap**. Snap is a directory of Web sites that the Snap directory team has chosen, divided into topic areas, and summarized. Within each topic area, sites are divided into more specific subjects to help you locate the type of information you want. Snap's top picks are marked with a Best icon.
- **Excite**. A hybrid search engine, Excite fulfills the traditional search engine definition (it is always visiting Web sites and cataloging them using a software program) but also has a directory—a subsection of its cataloged sites that have been reviewed by people.
- **Yahoo!** This is actually a directory rather than a search engine, meaning humans compile and categorize the sites it searches. So you may get fewer results. But Yahoo makes it easy to search for sites by category and to continue your search using a search engine if you want to.
- **MetaCrawler**. Rather than keeping its own database of Web sites, MetaCrawler conducts your search simultaneously on several search engines including Excite, Infoseek, Lycos, and Yahoo! This takes a little longer than using just one search engine, but it is likely to yield a more comprehensive set of results

Major search sites generally provide more than a search engine for finding Web sites They also allow you to look up information such as recent news stories, newsgroup postings, reference material (such as dictionary entries and maps), and e-mail addresses, street addresses, and telephone numbers of business and individuals. The guidelines for picking a search engine are as follows.

- If you're looking for a broad, common topic, such as how to buy a personal computer, use a search engine that tends to give you fewer results of higher quality (usually the type that relies on people to catalog sites), such as Yahoo!
- If you're looking for a rare topic, such as 19th-century Indian authors, use a site that may be less discriminating but yields more results (usually the type compiled by a software program), such as Excite.

4.2.2 Searching for newsgroups

Usenet newsgroups are Internet discussion groups on just about any topic you can imagine There are more than 50,000 newsgroups, and more are added all the time Here are some examples of newsgroups:

- sci physics.fusion
- soc.genealogy.hispanic
- rec.arts.animation
- alt.autos.antique

The **Google.com** search engine allows you to search millions of newsgroup messages to find a specific topic that interests you It also allows you to post your own message in response to what you read.

4.2.3 Searching the Internet

The two major ways that help in searching the Internet include:

- General searching
- Searching using Microsoft Internet Explorer 6 0

A) General searching

Some tips for general searching the Internet is given bellow:

(i) Use more than one search engine

No search engine indexes all Web sites and Web pages. So if your first search doesn't produce the results you want, try searching with at least one other search engine.

(ii) Read the About page

Many search engines have a link that leads to detailed information about how the search engine compiles and searches through information, and how to get the best results from it. Reading this page can save you a lot of time and headaches Also, visit search engine home page links with names like How To, Search Help, and Advanced Search for searching tips.

(iii) Get targeted results by being specific

The more specific your search word, the more targeted your search results will be If you search for the words labrador retriever, for example, rather than the word dog, your search will yield fewer sites but they will be targeted to the type of dog that interests you.

(iv) Get more results by being general

If your search word is too specific, your search may yield few or no results. To get more results, try searching for a related word that is more general.

(v) Define your search using Boolean operators

The major search engines let you select whether to search for the exact phrase you typed, all the words in the phrase but not necessarily together, any of the words in a phrase, and so on. A few search engines do not give you such options In this case, you can define the search yourself by adding one or more words or symbols to your search topic

- **AND**. To search for two or more terms on the same page· Type the word AND between the terms (example sea AND kayak). Or put a plus sign right before the second term (example sea +kayak).
- **OR** To search for either of two (or more) terms on the same page Type the word OR between the terms (example. kayak OR canoe).
- **AND NOT**. To search for pages that include the first term and not the second: Type the words AND NOT between the terms (example. kayak AND NOT whitewater). Or put a minus sign right before the second term (example· kayak -whitewater)
- **""** To search for an exact phrase: Enclose the phrase in quotation marks (example: "sea kayak rental").
- **()**. To group parts of your search. Enclose them in parentheses. For example, type kayak AND (gear OR equipment) This returns pages with both the words kayak and gear or both the words kayak and equipment.
- *****. To search for various forms of a word: Add an asterisk to the end of the word (example: kayak*) This returns pages with the words kayak, kayaks, kayaked, kayaking, and so on.

B) Searching using Microsoft Internet Explorer 6.0

Some tips for searching the Internet using Microsoft Internet Explorer is given below:

(i) Search the Internet with a search engine

1. On the toolbar, click the **Search** button.

2. In the Search bar that appears in the left pane of your Internet Explorer 6.0 window, choose your preferred search engine from the drop-down list in the box labeled **Select provider**.
3. Depending on the search engine you've chosen, you may now have some options for configuring your search. Make your selections, or accept the default selections
4. In the appropriate text box, type the word or phrase you're looking for, and then click **Search, Submit**, or **Go Get It**, depending on the search engine. The search results appear in the list within the Search bar.
5. Click any link to open the associated Web page in the right pane of your Internet Explorer 6.0 window
6. Any time you want to pursue another link from the search results, click it. The new Web page will open in the right pane
7. To hide the Search bar, click the **Search** button on the toolbar again

(ii) Search the Internet from the Address bar

1. In the Address bar, type **go, find**, or **search** followed by a space and the word or phrase you want to find For example, type **go labrador retriever**.
2. In the list of search results, click a link to display the Web page

Note: This Auto search feature uses only one search service to find information

(iii) Search for text on the current Web page

1. On the Edit menu, click **Find (on this page)** .
2. Type the text you want to find
3. Change any settings as needed.
4. Click **Find Next**

(iv) Find a Web site when a URL doesn't work

If the uniform resource locator (URL), or Web address, that you type in the Address bar or click in a Web page doesn't work, try this to correct the address.

1 On the **Tools** menu, click **Internet Options**
2. Click the **Advanced** tab.
3. Scroll to **Searching**. Under **Search when URL fails**
    - If you want Internet Explorer to ask if you want it to search for a similar address, click **Always ask**
    - If you want Internet Explorer to search without asking first, click **Always search**.
    - If you don't want Internet Explorer to search for a similar address, click **Never search**
4. If you want Internet Explorer to search for the address using a different domain, select the **Autoscan common root domains** check box. (A domain is specified by the three-letter extension such as .org, .edu, .com, and .gov in the address It tells you a site's type. If you select the Autoscan option, Internet Explorer will check the root of your URL with other domain extensions)
5. Click **OK**.

4.3.0 How to use E-mail

Electronic mail is one of the most popular features of the Internet. You can chat with your friends and family (and total strangers), conduct business, send documents, and stay in touch with people near and far. You can even check your e-mail while on the road. Some important terminology, concepts and mechanisms relating to the use of e-mail are discussed as follows.

4.3.1 The basics of sending and receiving

To send and receive electronic-mail messages, or e-mail, over the Internet and to organize your messages, you need an e-mail account. You can get this through an Internet service provider (ISP) or online service provider. You also need an e-mail client—e-mail software for your computer Your e-mail client creates an inbox on your computer When you check your e-mail, new messages are downloaded into your inbox

4.3.2 E-mail clients

Here are some examples of e-mail clients·

Microsoft® Outlook® 2002—a messaging and collaboration client; provides advanced e-mail, calendar, and contact management and a platform for workgroup information sharing when used with Microsoft Exchange Server. Outlook 2002 has loads of terrific new features. Check them out!

Hotmail™—the world's leading provider of free* e-mail Because it is Web based, everything you need to use Hotmail resides on the Internet, rather than on your computer. So you can use Hotmail on any computer that has access to the Internet If you travel, move, or change your Internet service provider, your Hotmail e-mail address and service stay the same.

Microsoft Outlook Express—designed for users who need fast, reliable e-mail and newsgroup functionality without the full capabilities of Outlook Outlook Express is included in the Microsoft Windows® operating system and is especially easy to use if you're using Microsoft Internet Explorer Web browser software version 6 0

Microsoft Exchange—Businesses today rely on their messaging and collaboration servers more than ever. Exchange gives you a comprehensive messaging platform, with the tools to create rich collaboration applications.

4.3.3 E-mail terminology

There are many acronyms associated with e-mail Here are some that you may come across

- **SMTP**—simple mail transfer protocol; the standard rules that many e-mail clients use to handle outgoing e-mail messages
- **POP3**—post office protocol version 3; the standard rules that many e-mail clients use to handle incoming e-mail messages.
- **MIME**—multipurpose Internet mail extensions, a format for turning an e-mail attachment, such as a Microsoft Word file, into ASCII text so it can be sent from one e-mail account to another

4.3.4 Anatomy of an e-mail address

To send a message to someone, you must type his or her e-mail address in the 'To section' of your e-mail message Generally, there are two parts to your e-mail address: your logon identity and the identity of your ISP These are separated by the symbol @ A typical e-mail address for someone who uses Hotmail, for example, looks like this: yourname@hotmail.com.

The extension—.com—indicates that Hotmail is a commercial establishment. Other common extensions are .gov for government users and .edu for educational users. E-mail addresses outside the United States may include letters that indicate the country of the user's ISP.

4.3.5 Attachments

You can send more than simple text in your e-mail messages You can also attach computer documents—including word-processor, spreadsheet, graphic, and video files—to an e-mail message So e-mail is a useful way to share files that more than one person wants or needs

With Microsoft Outlook 2002, e-mail gets even more sophisticated and easier Outlook 2002 allows you to send messages on hypertext markup language (HTML) "stationery," which contains background graphics and special pre-selected font designs and colors to match You can send e-mail directly from any application found in Microsoft Office 2002. The person who receives your e-mail with an attachment can open the attachment if he or she has the program in which the attachment was created. If the recipient does not have the program you used to create your attachment, he or she may be able to get the appropriate viewer such as Microsoft Word viewer or Microsoft PowerPoint® viewer. A viewer contains the components of a program needed to display a file created with the full version of the program To send an attachment, your e-mail client converts the attachment's digital code into ASCII text, using a format such as UUENCODE or MIME. In order for the recipient to read the attachment, the recipient's e-mail client must be able to decode this format, or he or she must have another program that can decode it.

4.3.6 The Newsgroups

If your e-mail client is also a newsreader, you can use it to subscribe to, read messages from, and post messages to newsgroups, which are online discussions on practically any topic Microsoft Internet Explorer 6 0 makes newsgroup access easy. On the Go menu, simply click News. Internet Explorer automatically launches Microsoft Outlook Express and opens your newsgroups folder So you can get down to business.

Here are some newsgroup basics.

- Each newsgroup covers a particular topic, often alluded to in its name.
- A newsgroup is a discussion string of related messages Each message responds to an earlier message or addresses the overall newsgroup topic in some way. You can post your own message in response to the messages that interest you most.
- You can find newsgroups that interest you by searching for them through the Google.com site Together, newsgroups make up Usenet, which you can think of as part of the Internet.

4.4.0 Creating a Web Page

Thanks to today's Web authoring tools and all the Web authoring resources on the Internet, you can create a great-looking Web site without knowing any hypertext markup language (HTML) code. The following steps are followed to create a web page:

(i) Getting a domain, or Web presence

Before you can post a Web site to the World Wide Web, you need a unique address for the site This address is your domain name. Microsoft's domain name, for example, is microsoft.com, and the uniform resource locator (URL) for Microsoft's home page is http://www microsoft.com/ms.htm. Some Internet service providers set aside portions of their hard-disk space for subscribers' Web pages that require no domain registration Check with your service provider to see if this is an option; it might be included in your monthly access fee.

(ii) Register a domain name

To ensure that each Web site has an address that no other site is using, domain names must be registered with the domain administrator. In most cases, this is InterNIC. InterNIC administers domain names ending in .com for commercial enterprises, .org for nonprofit organizations, .net for networks, edu for educational institutions, .gov for government organizations, and .mil for military services As the Web grows, new suffixes are being added frequently; some of the latest are .biz, .info, name, museum, .coop, and .aero.

You can search domain names to find out whether the name you want is taken and can register a domain name through InterNIC or Register.com. Networksolutions com provides detailed information about how to register and what is required before you can register.

(iii) Designing Web Page

Several Microsoft® products such as Microsoft FrontPage® 2002, Microsoft Publisher 2002, Microsoft XP make it easy for you to create your own Web site without any knowledge of HTML coding

With the FrontPage 2002 Web site creation and management tool, you can easily create and manage professional looking Web sites, using content-words, graphics, photo gallery, backgrounds themes [illegible] up to up etc

The Microsoft Publisher 2002, desktop publishing programme makes it easy to create professional quality web site, newsletter flyers brochures, business cards etc.

Microsoft office XP family of products include sophisticated tools for word processing, presentation of slides make the office suite a useful tool for web authoring.

- Microsoft Word 2002 word processor allows you to create and view documents as they will appear on the Internet Word provides custom templates to design Web pages and will save your documents in HTML format with the click of a button
- Microsoft Excel 2002 spreadsheet gives you an easy method for linking a spreadsheet to a Web page so that viewers can see the data presented in its intricate, tabular format
- Microsoft Access 2002 database management system will convert your data or reports to HTML so you can post dynamic, interactive database pages on the Web.
- Microsoft PowerPoint® 2002 presentation graphics program makes it possible to publish presentations on the Internet as Web pages, complete with animation and narration.

Designing a Web

Web page designing is a skill which can be developed by experience. In this chapter, a teacher begins by designing a school Web site There are certain preliminaries which one should consider before proceeding to design web pages.

Preliminaries for web designing

In order to create an outstanding Web site, it is required to plan the types of content and the types of Web pages in the Web site.

1. Brainstorm about the types of content to be on the Web site. This can include information about student activities and services, sports, academic departments and advancement requirements, alumni activities, and more.
2. Brainstorm about the types of links to be from the Web site. These can include links to research resources, professional educator organizations, and other educational sites
3. Begin an outline of the Web site.

To create a school home page the following activities may be taken into consideration.

- Calendar of Events
- Departments and Faculty
- Academic Requirements
- Alumni Activities
- Educational Links

Organizing the web's structure

The home page serves as the gateway to a Web site, so one should organize the Web site around it.

Determining purpose

Before creating a school website, its purpose must be made clear. It may be publicizing school events, keeping students up-to-date on deadlines and other activities, portraying a positive image of the school to the community where it exists.

Drawing an organization chart

A simple organizational sketch of how the pages of the Web site should be placed in relation to one another should be drawn where the home page remains at the top, and the rest of the pages are connected on one or more levels below the home page

Understanding good Web design

FrontPage 2000 and higher versions allow to use numerous themes, fonts, animations, effects, sounds, graphics, and more. In order to create a well-designed web site, one should have an idea about what design elements are required to enhance the look of the Web site

Good Web design consists of the following.

(i) A well-organized structure

(ii) Focused information

(iii) Consistency between pages

(iv) Easy navigation

(v) Well-maintained information and links

Understanding basic Web page design

In a well-designed Web site, visitors should always know where they are, and how to get where they need to go. To make sure that people can find what they need in a site, the pages should feature consistent layout elements. Applying basic page design to a site will make it easier to navigate through and more pleasant for people to visit.

The structure of a Web page includes a header, body or active page, and footer:

1. **The header**, at the top of the Web page, can include a title, banner, shared borders, or navigation bars that provide links to other pages.
2. **The body** contains text stating the Web's purpose and provides information It can also include navigation bars, images, sound, motion clips, and other links.
3. **The footer**, at the bottom of the printed page, may include an address, phone number, e-mail address, date of last update, hit counter, or links.

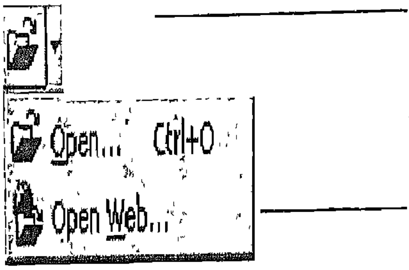
Note: The header and footer usually look the same on most of the pages in a Web. The easiest way to have the same information on each page is to use the **Shared Border** feature in FrontPage 2000. Shared borders helps to create the header and footer on one page, and have automatically copy them onto other pages within the Web

To open an existing Web

The following steps can be followed to open an existing web page:

1 Open FrontPage 2000.

Click the arrow next to the Open button, and click Open Web. The Open Web dialog box opens to the Web worked on most recently.



Click the arrow next to the Open button.

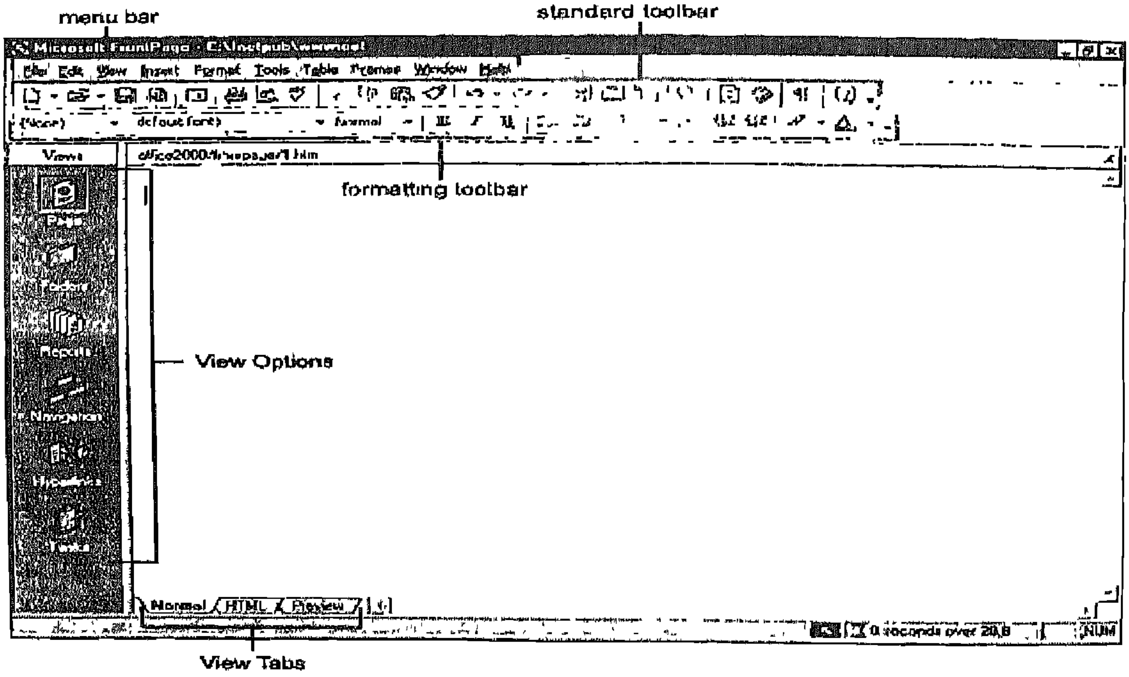
Then, click the Open Web button.

In order to work on any other web, click on open option

The Web opens in Page view

FrontPage Screen Layout:

Below is a diagram of the default page layout in FrontPage It can be changed by selecting a different View Option

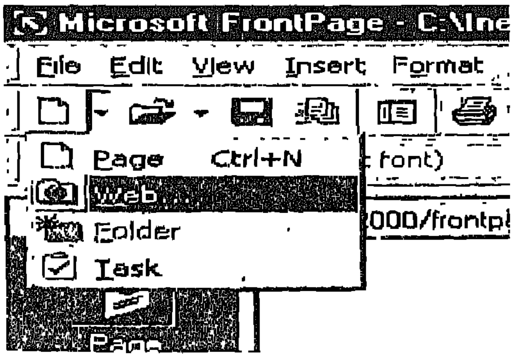


Views

- **Page view** gives an editing environment for creating and editing web pages
- **Folders view** lists all of the files and folders in your web for easy management.
- **Reports view** identifies problems with pages and links in the web including slow-loading pages, broken links, and other errors
- **Navigation view** lists the navigation order of the site and allows you to change the order that a user would view the pages.
- **Hyperlinks view** allows you to organize the links in the web pages.
- **Tasks view** provides a grid for inputting tasks you need to complete in your web.

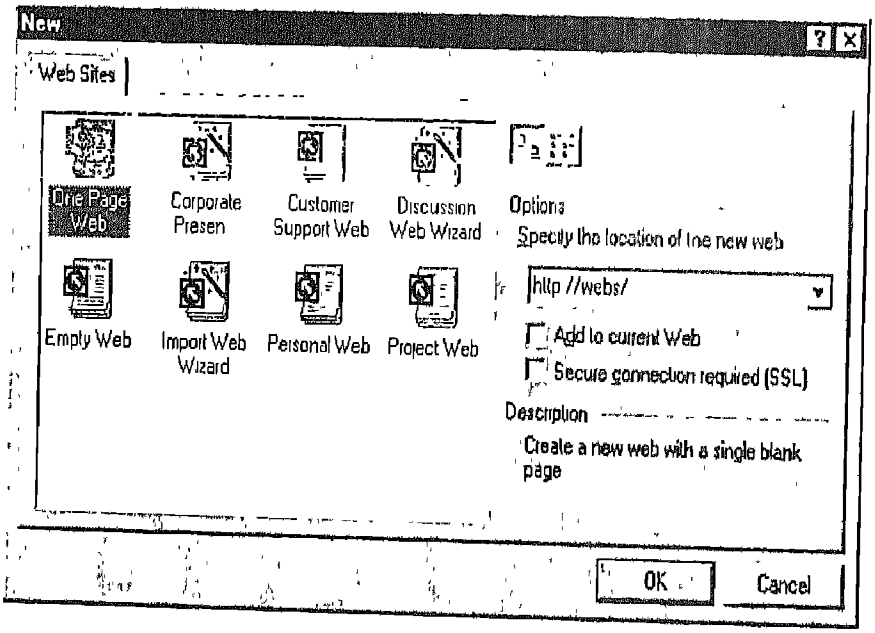
Creating a Web Using the Web Wizard

- Open FrontPage and select **File|New|Web** . from the menu bar or click the small down arrow next to the New button on the standard toolbar and select Web ...



- Select the type of web you want to create. It is usually best to create a simple One Page Web, which you can add additional blank pages to as you need them. Enter a location for the web in the box provided beginning with "http://". This is the location where you can preview the web on your computer It will need to be copied to the server to be viewed to the world on the WWW.

- Click OK and wait for FrontPage to finish creating the web
- Now, explore your web Click Folders view to see the initial page (default.htm) that was created and two folders. The "images" folder is where you will place all your graphics and photos While it is not imperative that the images be placed in a separate folder, it keeps the web organized.



Options

Specify the location of the new web

http //webs/

☐ Add to current Web

☐ Secure connection required (SSL)

Description

Create a new web with a single blank page

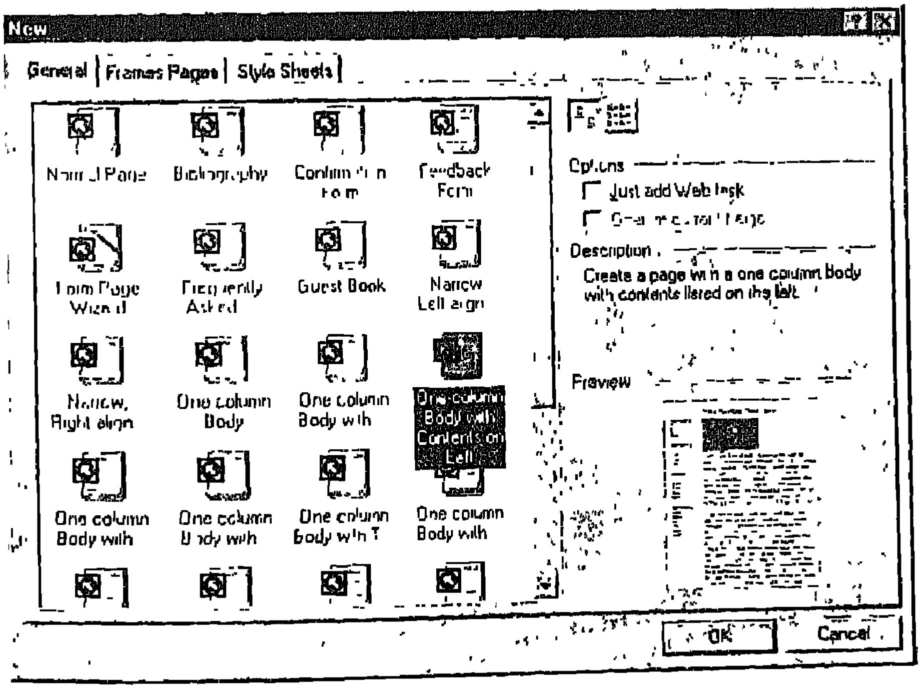
- Click on Reports view to see a list of reports for the site. As yo construct your web, this page will be much more useful From here, yo can identify and correct broken hyperlinks and fix large pages that take long time to load.
- View the navigation layout of the web by clicking Navigation view Right now, there is only one page - the home page - listed As more page are added, this page becomes helpful to see how all your pages are linke together

- Hyperlinks view allows you to manage the links on your pages
- Optional - in Tasks view, list the tasks that need to be accomplished to create the web. Select **Edit|Task|Add** Tasks to add a task. Or click the down arrow beside the New button on the standard toolbar
- Make pages and save them, marking them as completed in the task view
- Click Folders view to locate the open the next page to work on
- When you are ready to publish your web on the FGCU server, copy the folder to the server.

Creating a Web Page from a Template

FrontPage provides many individual page templates that can be added to any web. Follow these steps to add a template to a web page.

- Select **File|New|Page..** and choose a template.

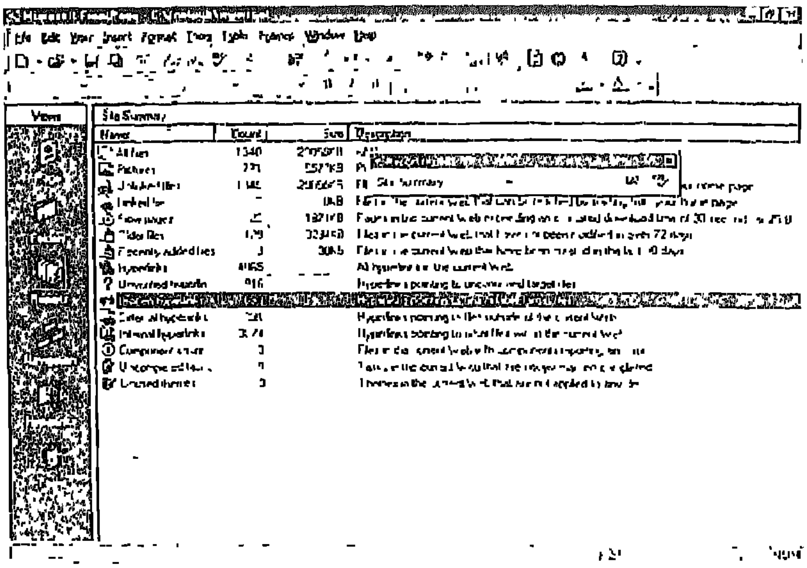


Create a page with a one column body with contents listed on the left.

- Select a template and click OK.
- Replace the place-holding body text with your own text and photos with images you would like on your web page.

Report View

When your web is completed, click Reports view to verify that links are correct and use the Reporting toolbar to switch between reports.



Open A Web

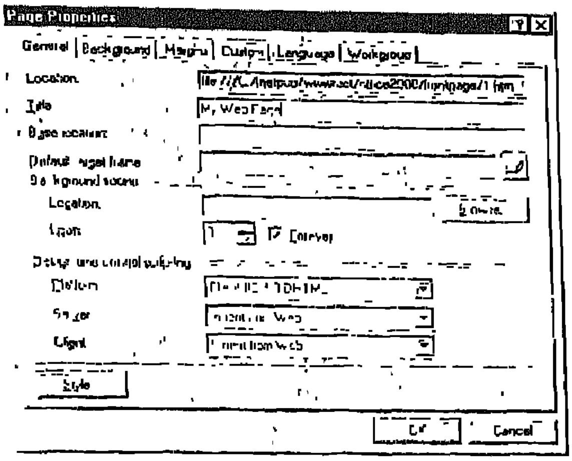
To open a web you have already created, select **File|Open Web...** from the menu bar. Select the web folder from the list and click Open.

Saving A Web

Save all the pages within the web created by FrontPage. These pages, however, are not visible to anyone on the Internet. You must copy the entire web folder to a network drive.

Page Properties

Change various page properties by selecting **File|Properties** from the menu bar. The Page Properties window will allow you to change many general properties, the page background, margins, and more.



- General - Under the General tab, one property that needs to be changed is the Title. This is the text that will appear across the top of the screen above the browser's menu bar when the page is viewed on the web. Background sounds are not recommended and design-time control scripting options do not need to be changed.

Adding and deleting pages:

To add a page to your Web

1. On the Views toolbar, click to go to the Navigation view
2. Click the page to which you want to add a new page.
3. Click to add the new page.
4 To name the page, right-click the new page and click Rename, and then type the new page name.

To delete a page from your Web

1. On the Views toolbar, click to go to the Navigation view
2 Click the page you want to delete.

3. On the Edit menu, click Delete The page no longer appears in the Navigation view.

Organizing and managing pages:

FrontPage 2000 makes it easier than ever to manage the development of a complex Web site by allowing to easily move Web pages, assign, track, and update tasks, and keep track of broken links, slow pages and old files.

To move a page within your Web

1. Click the page you want to move
2. Drag the page to the preferred location by clicking and holding the mouse button down while moving the pointer to the new location.

Connecting Pages

After creating the web pages, it is essential to establish link among themselves Then only navigation within the pages can be possible.

Like the term "World Wide Web" suggests, the Internet is made up of an enormous numbers of linked computers, Web sites, documents, images, and text. Hyperlinks are what make up the strands of the web. When a link is established to the World Wide Web, then the site becomes part of a huge network of information and with FrontPage 2000, becoming a part of the World Wide Web is simple.

Before You Begin

1 Make an outline to determine the pages to link together.
2. Decide on an e-mail address to use as a point of contact for people who wish to correspond with someone involved with the Web site
3. Make a list of sites that is required to create links to.

Creating Hyperlink

Hyperlinks connect locations on the World Wide Web, such as Web pages, different sites, or just paragraphs located on the same page. Hyperlink destinations can be text, graphics, e-mail addresses, files (such as a multimedia file or Microsoft Office document), or programs A hyperlink can be text or a picture.

Images containing hyperlinks are known as image maps A well-designed image map gives users visual cues about where each hyperlink takes them. For example, an image map for a tourism bureau could be an actual map of a geographical region Clicking on a city in the map to get tourist information about the city

By typing a hyperlink in Page view, FrontPage 2000 automatically formats the link. The text and a line below it appear in blue and, with an active Internet connection, a link occurs when it is clicked

Understanding the URL:

The destination of a hyperlink is encoded as a URL, or **Uniform Resource Locators** URLs, also known as web addresses, contain information about web servers or network location, path, and file name

http // www.microsoft.com/frontpage/productinfo/default.htm

Protocol

Web server or network location Also called a domain

Path

File name

Hyperlinks are made up of URLs that are either absolute or relative.

(vi) An absolute URL contains the full address and is generally used for linking different sites.

(vii) A relative URL has one or more missing parts and is generally used for linking within a particular site If the protocol and domain are missing, the Web browser uses the protocol and domain of the current page

At the time of creating hyperlinks in FrontPage 2000, it is not required to know the destination URL For hyperlinks to destinations in the Web from the source , FrontPage 2000 creates relative URLs. By generating relative URLs, FrontPage 2000 saves the time.

Creating a hyperlink to a page or file in a Web

Creating hyperlinks with FrontPage 2000 is easy Use Create Hyperlink dialog or drag and drop to create a hyperlink to a destination such as a page or file in a Web. It is also possible to create hyperlinks from the home page to the other pages in the Web or create a hyperlink to a GIF picture

To create a hyperlink within your Web site

1. Open the source web site and go to Page view, and then double-click central_high_school_home_page.htm Each of the bulleted items has the title of a Web page already in the text.
2. Select *Calendar of Events* in the first bulleted item to link to the Calendar of Events page in you Web site.
3. Click the Hyperlink 🔗 button
4. Click calendar_of_events.htm in the Create Hyperlink dialog box and then click OK. The text changes color and now has an underline indicating that it is a hyperlink.

To create a hyperlink to the World Wide Web

1. In Page view, double-click educational_links.htm.
2. Type the text you want to use as a hyperlink and then select it. For example, type and select "Encarta Schoolhouse."
3. Click the Hyperlink button
4. Type the URL in the URL area and click OK.

   -Or-

   Click the World Wide Web button In your Web browser, browse to the page that you want, and then press ALT+TAB to switch back to FrontPage 2000. The location of the page you visited is displayed in the URL box

If you want to have the URL on the page, you can create a hyperlink by simply typing the full URL and pressing RETURN. FrontPage 2000 automatically creates a hyperlink to the URL you typed. For example, for the Encarta Schoolhouse hyperlink, simply type http://encarta.msn.com/schoolhouse/default asp

Creating a bookmark

A bookmark, also known as an anchor, is a location or text on a page marked as a destination for a hyperlink If a Web page is long and divided into sections, a bookmark allows you to link to a section of the page rather than to the top of the page as with conventional hyperlinks. To display the section of a page to the site visitor, insert a bookmark at the beginning of the section, and then create a hyperlink with the bookmark as its destination. When the site visitor clicks the hyperlink, the relevant part of the page is displayed, rather than the top of the page.

If a location is bookmarked, a blue flag can be seen when looking at the Web page in Page view with the Normal tab selected. The flag is simply a reminder of the bookmark's location. It is not visible when viewing the Web page in the browser If text is bookmarked, the text is displayed in Page view with a dashed underline when the Normal tab is selected.

To create a bookmark

1 In Page view, position the insertion point where you want to create a bookmark, or select the text to which you want to assign the bookmark.

2. On the Insert menu, click Bookmark

3. In the Bookmark name box, type the name of the bookmark (spaces are allowed).

Create a hyperlink to a bookmark

1 In Page view, type the text you want to use as a hyperlink, and then select it
-or-
If you want to use the name of a bookmark as the hyperlink text, position the insertion point where you want to insert the hyperlink

2. Click the Hyperlink button.

3. Select the page that contains the bookmark.

4. In the Bookmark box, click the bookmark you want to use as the destination

Adding linked graphics to a Web

It is possible to create links using graphics rather than ordinary text When graphics are inserted, it is a good idea to also add ALT text, which creates a description of the graphic that visitors see when they hover a cursor over the graphic. ALT text is helpful when visitor with disabilities cannot see the graphic or if the graphic is not available for viewing.

To insert an image

1. On the Educational Links page, place the cursor to the left of the Encarta Schoolhouse link.
2. On the Insert menu, point to Picture, and then click Clipart. The Clip Art Gallery dialog box appears
3. On the Pictures tab, scroll down and click Buttons & Icons.
4. Click the button graphic you prefer, and then click the Insert clip button.

To add ALT text to a graphic

1. Right-click the image you just inserted.
2. Click Picture Properties, and then click the General tab
3. Under Alternative representations in the Text box, type the text that you want to appear in the event that the graphic is not available to the person viewing your Web page. For example, type This button is a link to Encarta on the Encarta link button.
4. Click OK.

To create a hyperlink from a graphic

1. Click the image you just inserted.
2. On the Standard toolbar, click the Hyperlink 🌐 button. The Create Hyperlink dialog box appears

3. In the Create Hyperlink dialog box, type the Encarta Schoolhouse URL in the URL box.

4. Click OK. The button is now a hyperlink.

Creating image maps

Image maps are graphics that contain multiple hyperlinks. FrontPage 2000 allows to create image maps by inserting the image on the page and using the tools on the Image toolbar to create several hotspots that include hyperlinks A hotspot is an area on a graphic that links to another page or Web site. Generally, hotspots are simply an area on a graphic, but you can also add text to the hotspot.

To insert an image

1 On the Educational Links page, place the cursor to the right of the Encarta Schoolhouse link and press ENTER

2. On the Insert menu, point to Picture, and then click Clipart. The Clip Art Gallery dialog box appears.

3 In the Search for clips box, type world

4. Click the globe graphic, and then click the Insert clip button.

5. Add ALT text to the graphic.

To create a hotspot

1. On the View menu, point to Toolbars, and then click Pictures

2 On the Pictures toolbar, click the Rectangular Hotspot [▭] button The mouse pointer becomes a pencil

3. With the pencil, draw a rectangle around North America to create a hotspot The Create Hyperlink dialog box appears

4 In the URL box, type http://encarta.msn.com/evg/default.shtm, the URL for the Encarta Virtual Globe

5. Click OK. The area is now a hyperlink

To create a text hotspot

1. On the Pictures toolbar, click the Text A button.
2. In the text box that appears, type Xpeditions.
3. Move the text box to the location you want by clicking and dragging the text box border.
4. Double-click the border of the text box The Create Hyperlink dialog box appears.
5 In the URL box, type xpeditions/main html? main=hall, the National Geographic Expeditions URL and then click OK.

Adding an e-mail hyperlink:

In addition to conventional hyperlinks, you can also add links to e-mail. You can create a hyperlink that opens and addresses an e-mail message to the address you specify. This allows visitors to your Web site to send you comments

To add an e-mail link

1 Go to the Central High School Home Page in Page view
2. Position the pointer after the fax number in the bottom shared border, and press ENTER.
3. On the Standard toolbar, click Hyperlink 🌐.

4. In the Create Hyperlink dialog box, click Make a hyperlink that sends E-mail . The Create E-mail Hyperlink dialog box appears

5. In the Type an E-mail address text box, type the address you want comments to be sent to, and click OK

6 In the Create Hyperlink dialog box, click OK.

Removing Hyperlink

At some point, you may decide you want to remove a link if your Web changes or if the link no longer works because someone else's site has changed. Deleting a hyperlink from a page is simple

To remove a hyperlink from your Web

1 In Page view, select a hyperlink on one of the pages in your Web site.

2. Do one of the following:

   (i) To delete the hyperlink completely, including the hyperlink text, press DELETE

   (ii) To preserve the hyperlink text but delete the hyperlink associated with it, select the hyperlink, and then click Hyperlink button. Select the contents of the URL box, and then press DELETE

Managing hyperlinks on your Web site

With FrontPage 2000, it is possible to check a Web whether carries incorrect or broken hyperlinks and quickly, repair them. A broken hyperlink is one that has an invalid destination URL and returns an error if the site visitor clicks the hyperlink.

Verifying hyperlinks

A critical part of managing a Web site is verifying that the hyperlinks go to the correct external destinations (destinations that are outside of the Web). After hyperlinks have been verified, their status does not change until the hyperlinks is verified again, or close and reopen the Web.

To verify your hyperlinks

1. In Reports view, click the Verify Hyperlinks ☑ button on the Reports toolbar.
2. Select the Verify all hyperlinks option, and then click Start. The status of all hyperlinks in the current Web appears

In order to verify all of your hyperlinks, save all open pages.

Repairing broken hyperlinks

A hyperlink might have an invalid URL for various reasons; it might be mistyped or if the destination page is on another World Wide Web site, the page might have been changed or removed.

To repair a hyperlink

1. On the View menu, point to Reports, and then click Broken Hyperlinks.
2. All broken hyperlinks in your Web are listed. If a hyperlink's destination is not in the current Web, the status of the hyperlink is Unknown.
3. Double-click a hyperlink with Broken status

4 To display the page to edit it, click Edit Page.

5. If you know the correct URL of the destination, edit it in the Replace hyperlink with box

-or-

Click Browse to browse to the page or file in a Web, file system, or World Wide Web

6. To repair other occurrences of this hyperlink in all pages in the current Web, click Change in all pages.

-OR-

To repair other occurrences of this hyperlink in selected pages, click Change in selected pages, and then select the pages.

7 Click Replace. If the hyperlink's destination is not in the current Web, the status of the hyperlink changes to Unknown. If the destination is valid, the hyperlink no longer appears in the Broken Hyperlinks report.

Previewing the Web in the browser:

After creating the hyperlinks, it is required to test each link. It is possible to check by previewing the Web with a browser. . (A browser is software that displays Web pages.) When your Web site is open in the browser, click each link to make sure it works properly. Use the Back button to return to your own Web site. FrontPage 2000 includes Microsoft Internet Explorer 5.0, a popular Web browser You can use Internet Explorer 5.0 to review pages you have created, to check hyperlinks, and to explore the World Wide Web.

To preview the web using Internet Explorer 5.0

Simply click the Preview tab.

To preview the Web using other browsers

1. On the File menu, click Preview in Browser.

2. In the Preview Browser dialog box, select the browser you wish to use, and click Preview. The browser opens to your Web site.

3. Click some of the links you made in this chapter and look at the work you have done

4 On the click Close when you are finished previewing.

5 In addition to adding hyperlinks to text, graphics, pages, and sites, FrontPage 2000 lets you create links to Microsoft Office documents This is especially helpful if your Web site is on an intranet and you want other educators to have access to Microsoft Office documents.

Extending your knowledge:

With FrontPage 2000, it is possible to quickly and easily create hyperlinks to Office documents, such as documents created in Word or Excel. When a visitor to the Web site clicks a hyperlink to an Office document, the document opens. Some Web browsers display the document inside the browser window, other browsers open a separate window.

To create a hyperlink to an Office document

In Page view, type the text you want to use as a hyperlink and then select it. For example, type and select "Budget Spreadsheet."

Click the Hyperlink button.

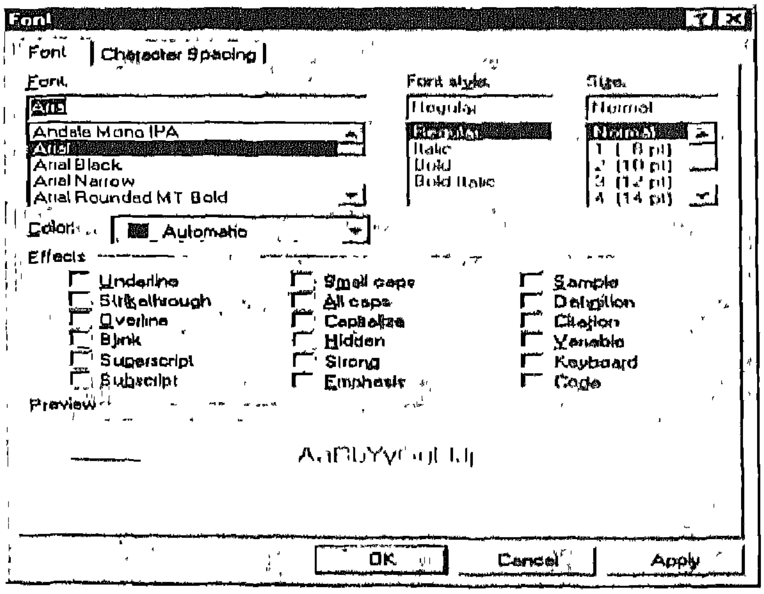
If the Office document is in the current Web, navigate to the Web in which the document is located, and then select the document

If the Office document is on the local file system and you have access permission to the file, click the File button, browse to the document, and then select it. Import the file into your Web site. Click OK (The text you selected is now a link to the document.)

Text

Font Properties

Many properties of fonts can be changed from the Font dialog box. Highlight the text that will be formatted and select **Format|Font** from the menu bar.



Font: Arial

Font style: Regular

Size: Normal

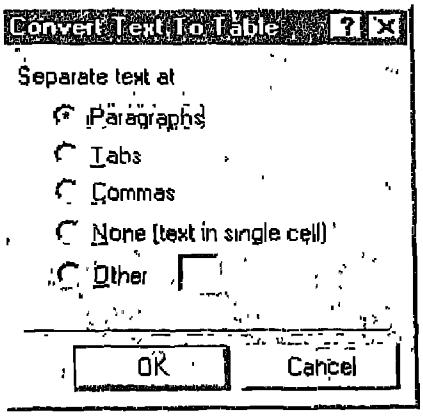
Color: Automatic

- **Font** - Select a simple, common font for the web page. Keep in mind that the list that appears in FrontPage is the list of fonts loaded onto the client's computer while many of the visitors of the web site will not have the same fonts. Choose a font such as Arial, Geneva, Verdana, Helvetica, or another sans-serif font that is easy to read and most people have loaded on their computers

- **Font Style** - Select bold, italics, or a combination of both.
- **Size** - Font sizes on web pages are designated by different values than the point sizes you may be used to working with in Word and other word processing programs. Font sizes are listed in parentheses next to the HTML point sizes. A point size of 2 or 3 is usually best for paragraph text.
- **Effects** - Many of these effects are unnecessary and some are not viewable on all browsers It is not recommended to underline any text as this will create confusion since links are usually underlined. Use bold and italics to emphasize text instead of underlining Blink is an old HTML specification and since it is quite annoying, many browsers no longer support it.
- Press OK when finished.

Converting Text to Tables

The text can be put into a table by selecting **Table|Convert|Text** to Table from the menu bar. This dialog window will appear. Make a selection and click OK.



Separate text at
● Paragraphs
○ Tabs
○ Commas
○ None (text in single cell)
○ Other

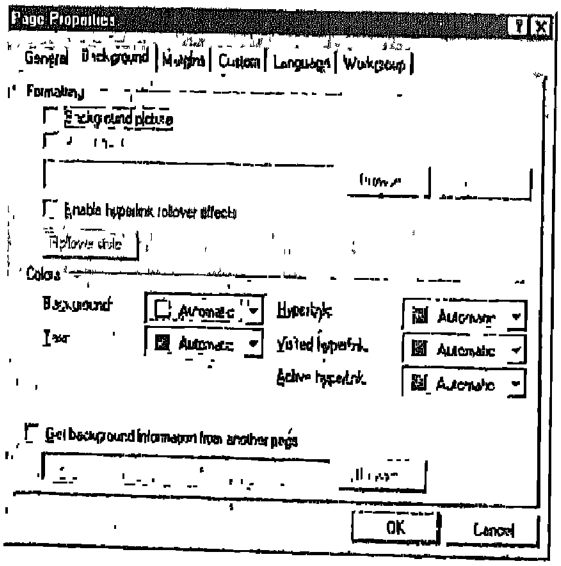
- **Paragraphs** - A new table row will begin at each new paragraph. Each line is placed in a single cell on a new row

- **Tabs** - A new column will begin at each tab stop

- **Commas** - A new column will begin at each comma. The text below produces the same table format as the TAB setup

- **None** - All the highlight text will be placed into a single table cell.

- **Other** - Select another delimiter for creating a table.



☐ Background picture

☐ Enable hyperlink rollover effects

Background: Automatic

Text: Automatic

Hyperlink: Automatic

Visited hyperlink: Automatic

Active hyperlink: Automatic

☐ Get background information from another page

- **Background**

Check the Background picture box and select an image by clicking the Browse. . button to add a repeating graphic to the background of the page.

Enable hyperlink rollover effects adds a Cascading Style Sheet to the page that causes the appearance of text links to change when the mouse is placed over them. These effects are not visible in Netscape version 4 and lower

Set the Background color and a default Text color if it is not black.

Hyperlink colors can be changed as well. The color set for Hyperlink will be the color of the text of a link that has not been viewed yet by the web site user Visited hyperlink is the color the link will turn after the page has been visited. Active hyperlink is the color of the link as it is being pressed. This color is usually barely seen as the user quickly clicks the link. The default colors that web users are used to are blue for normal and purple for visited. Refrain from swapping these colors so users will not be confused!

- Margins - Set the top and left margin width by pixels if necessary. It is not necessary to alter any of the properties on the remaining tabs.

Themes

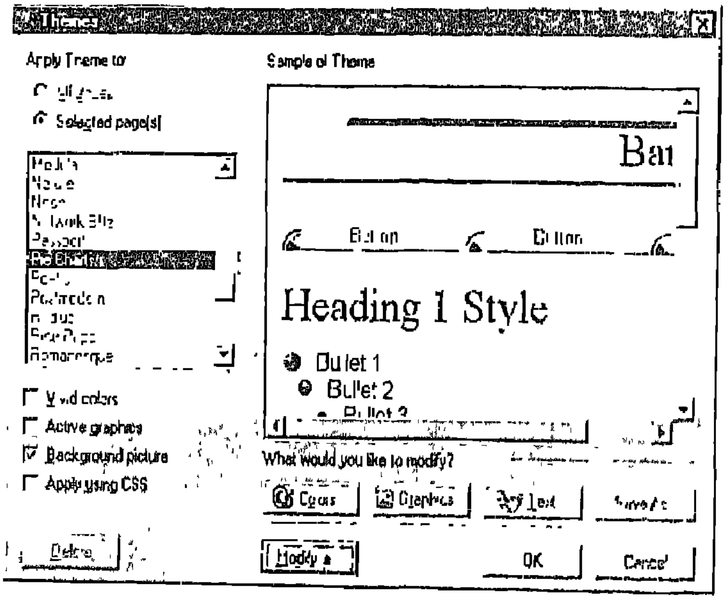
Themes can quickly add color, graphics, and a common layout to your web pages.

Open a web page and select **Format|Theme** from the menu bar or right-click on the page and select Theme. . from the shortcut menu.

- Under Apply Theme to, select All pages to add the theme to all pages in your web or Selected page(s) to only apply the theme to activated pages.
- Scroll through the theme selections and highlight the theme names to preview the theme in the Sample of Theme window Click the check boxes to change the theme as well.
  - Vivid Colors enhances the colors of the theme.
  - Active Graphics will convert navigation buttons to Java applets that change when the mouse hovers over them
  - Background picture including a repeating background image to the page. Uncheck the box for a plain color background.

- Apply Using CSS will add the properties to a style sheet.

- Click OK when you have chosen the theme



○ All pages
● Selected page(s)

☐ Vivid colors
☐ Active graphics
☑ Background picture
☐ Apply using CSS

Removing a Theme

To remove a theme from a page after it has been applied, select **Format|Theme** from the menu bar and select the first "(no theme)" option from the themes list. Click OK.

Tables

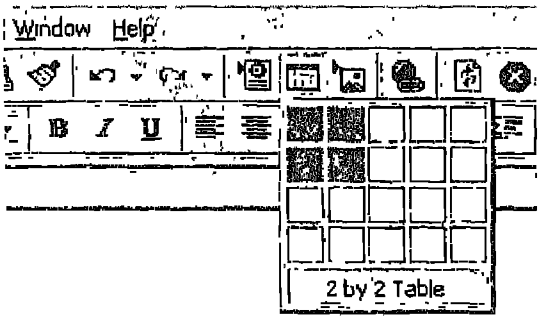
Table Uses

On web pages, tables can serve many functions.

- Page layout
- Displaying information in formatted tabular form
- Adding background color and borders to blocks of text

Creating a Table

A quick way to create a small table is using the table button on the standard toolbar. Click the button and drag the mouse over the grid, highlighting the cells that should appear on the table When the table size has been selected, click the mouse button again



A table outline with 2 rows and 2 columns will appear on the page:

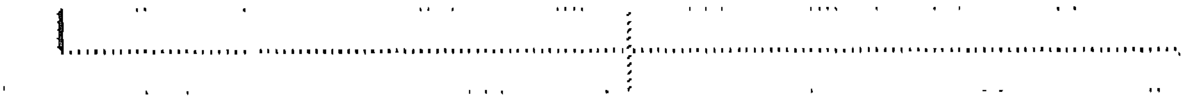
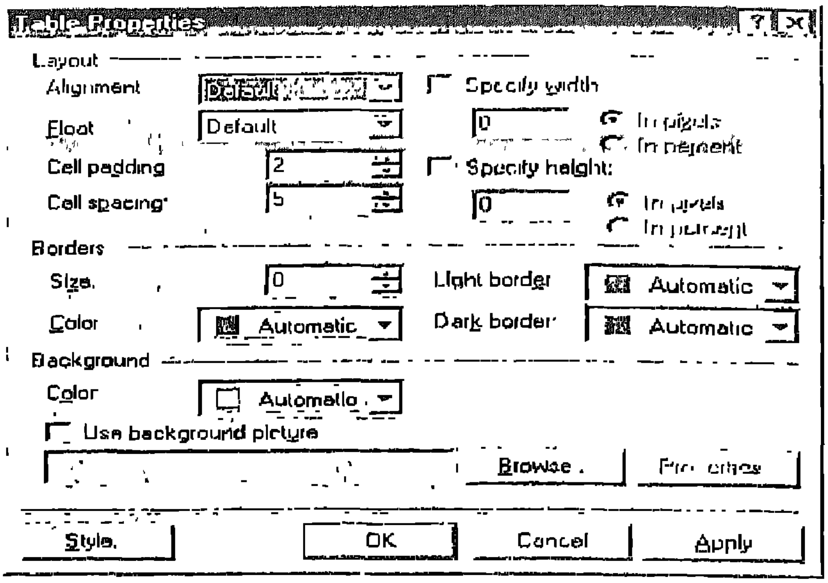


Table Properties

Select **Table|Properties|Table** from the menu border to modify the table's properties.



Layout

Alignment: Default

Float: Default

Cell padding: 2

Cell spacing: 5

☐ Specify width: 0 ● In pixels ○ In percent

☐ Specify height: 0 ● In pixels ○ In percent

Borders

Size: 0

Color: Automatic

Light border: Automatic

Dark border: Automatic

Background

Color: Automatic

☐ Use background picture

- **Alignment** refers to the table's position on the page, not the alignment of the text within the table. Choose "Center" to center the table on the page, or select left, right, or justify. Default is usually left alignment.
- **Cell padding** is the number of pixels between the text and the cell walls.
- **Cell spacing** is the number of pixels between the table cells
- Specify width sets the width of the table by a distinct number of pixels or by a percentage of the screen width.
- Specify height is usually not necessary to set since the height depends on the number of rows in the table

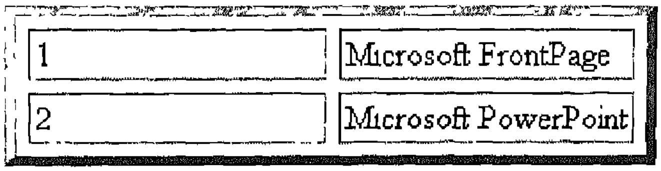
The following table was produced by the settings shown in the window above

1	Microsoft FrontPage
2	Microsoft PowerPoint

- **Border size** indicates the depth of the table border. The dotted lines on the table above are shown only as a visual reference of the table structure, but since this table's border is set to 0 pixels, no borders will show on a web page:

1.	Microsoft FrontPage
2	Microsoft PowerPoint

Below is the same table with a border set to 5 pixels:



1	Microsoft FrontPage
2	Microsoft PowerPoint

- **Border color** will change the color of the borders on the table. The MSIE and Netscape browsers read this property differently. MSIE changes all the border to the solid color, while Netscape keeps the three-dimensional quality of the table and only changes the outer border of the table. Since FrontPage is a Microsoft product, you will always see the MSIE version when constructing a web page in FrontPage.

- Light border and dark border change the highlight and shadow colors of the table Be aware that these attributes are not read by Netscape

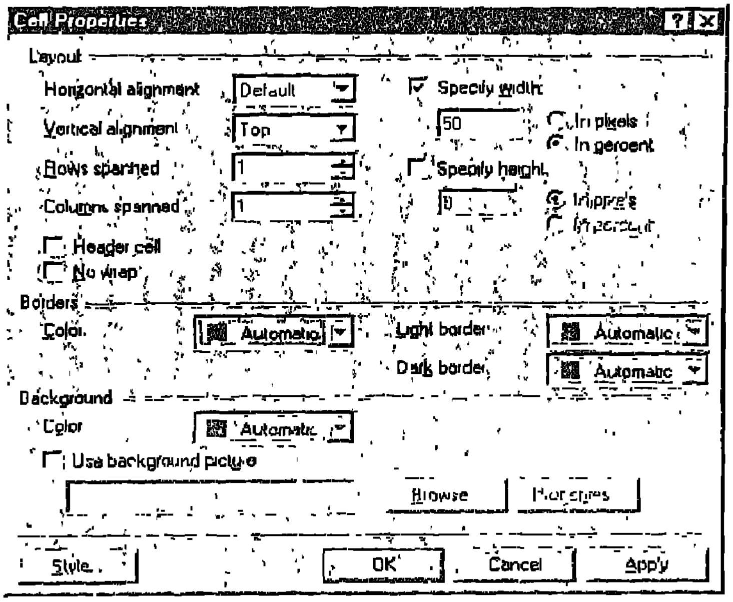
- Background color adds a background to the table cells. MSIE will add the color to the background of the cells and the space between the cells while Netscape only adds the color to the background of the cells

- Use background picture will add a background image to the table and again, there are differences between browsers. MSIE will repeat the image over the entire background of the table while Netscape repeats the image in each cell·

Cell Properties

Select **Tables|Properties|Cell** from the menu bar or Cell Properties from the shortcut menu to change the properties of the table cells. Begin by highlighting the cells whose properties will be changed.

- **Horizontal alignment** is defaulted to the left side of the table cell Change this attribute to center or right-justify the text within th table cell.
- **Vertical alignment** is defaulted at middle as shown in th example below. Since the text in the right-hand column cove more than one line and the left-hand cells do not, that text i centered vertically in the cell. Select "top" or "bottom" to overrid this default setting Setting rows spanned and columns spanned is better achieved b a method explained below.
- Specify width and specify height will set the width and height of th cells. Percentages refer to the portion of the table, not percentage of the entire screen.
- Select Header cell to automatically bold and center the content o the cell.
- Border color is a setting that is not read by Netscape Thi changes the color of the cell border only when viewed with MSIE.



Cell Properties

Layout

Horizontal alignment: Default

Vertical alignment: Top

Rows spanned: 1

Columns spanned: 1

☐ Header cell

☐ No wrap

☑ Specify width: 50 ○ In pixels ● In percent

☐ Specify height: 0 ● In pixels ○ In percent

Borders

Color: Automatic

Light border: Automatic

Dark border: Automatic

Background

Color: Automatic

☐ Use background picture

- Light and dark border settings will additionally be read by MSIE but not by Netscape

- Background color changes the cell's background color In Netscape, this is the same effect of setting the entire table's background color since the color is not added between the cells.

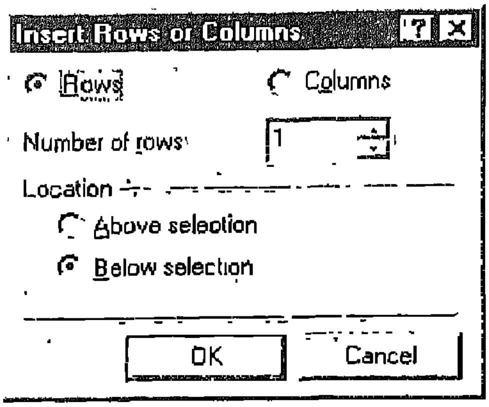
- Background image adds a graphic to the background of each cell. In Netscape, this is the same effect as setting the background graphic for the entire table since it begins a new repeating pattern for each cell.

Inserting Rows and Columns

Quickly add rows or columns to a table by placing the cursor in the cell the new row or column will be adjacent to, right-click the mouse to access the popup shortcut menu, and select Insert Row or Insert Column Another method is to use the Insert Rows or Columns dialog box:

- Place the cursor in a cell where the new row or column will be adjacent to.

- Select **Table|Insert|Rows** or **Columns** from the menu bar.



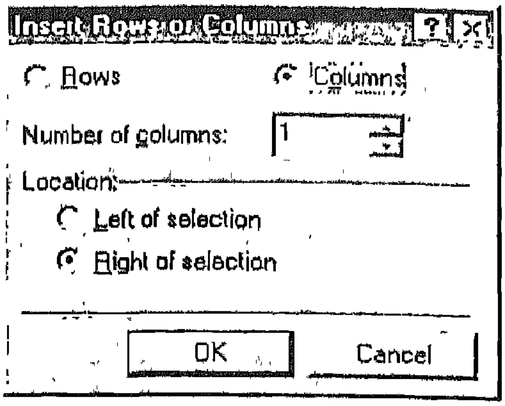
● Rows ○ Columns

Number of rows: 1

Location

○ Above selection

● Below selection



○ Rows ● Columns

Number of columns: 1

Location

○ Left of selection

● Right of selection

- To insert a row, select Rows and enter the Number of Rows. Then select the Location of the new row by selecting Above selection or Below selection from where you placed the cursor in step 1.
- Click Columns to insert a new column and the choices will change. Enter the Number of columns and the Location left or right of the selected point
- Click OK.

Spanning Cells

There is often the need to create a cell than spans rows or columns, such as a title at the top of a table. This example will begin with the same table already used on this page

- Insert a new row to the top of the table
- Type the text of the row that will be spanned across the columns by typing into the first cell and highlight the cells.

- Select **Table|Merge Cells** from the menu bar or right-click with the mouse and select Merge Cells from the popup shortcut menu..

- Center the text in the cell by from the Cell Properties window and deselect the cell.

To split the cell again, select the cell and choose Table|Split Cell from the menu bar.

Graphics and Pictures

HTML code used on the web recognizes two basic graphic formats - GIF and JPEG All the images on your web page must be either of these formats

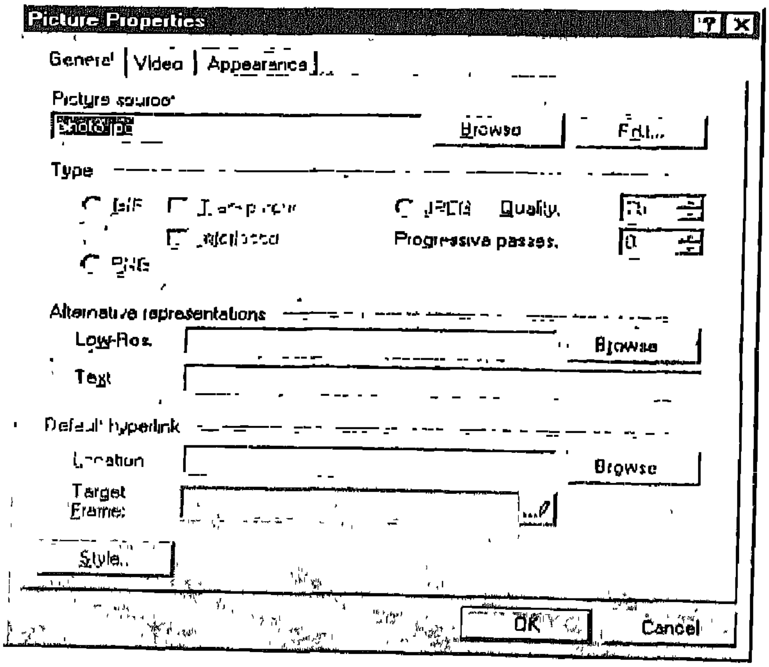
- **JPEG** (Joint Photographic Exchange Group) - As a general rule, photos should be saved as JPEGs This file type consists of 16 million colors.
- **GIF** (Graphic Interchange Format) - These files contain 256 colors or less and should generally be used for non-photo graphics.

Inserting a Graphic

To add a photo or graphic to a web page, select **Insert|Picture**|From File from the menu bar. Choose the file and click OK.

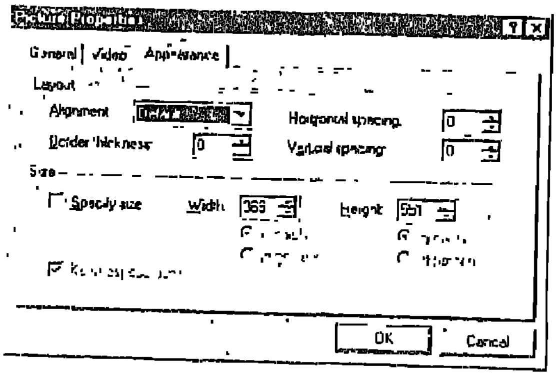
Picture Properties

To change the properties of the picture, select the image and choose **Format|Properties** from the menu bar



Below Alternative representations, type a description of the image in the Text box. This text will appear in place of the graphic if the user browses your site with graphics turned off on their browser and will also be displayed while the picture is loading

Click the Appearance tab.



- Change the Alignment if the picture should be aligned to the right or left of the text on the page or if it should be centered on the page.
- Border thickness will add a border to the picture depending on the number of pixels you enter. Leave this value at "0" if there is no border on the picture.
- Horizontal spacing and Vertical spacing are measured in pixels and will add white space surrounding the picture either above and below (vertical) or on both sides (horizontal).

Miscellaneous

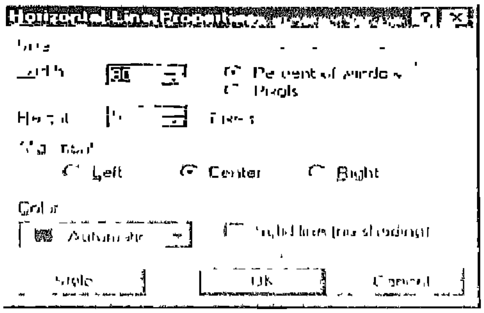
Horizontal Lines

Horizontal lines can divide sections of text for easy reading

- Place the cursor on the page where the horizontal line should be added
- Select **Insert|Horizontal** Line from the menu bar
- Double click on the line to change its properties

  - Set the Width of the line either as a percentage of the window or an absolute size in pixels.
  - Change the thickness of the line by setting the Height in pixels
  - Set the Alignment of the line to the left, center, or right size of the page

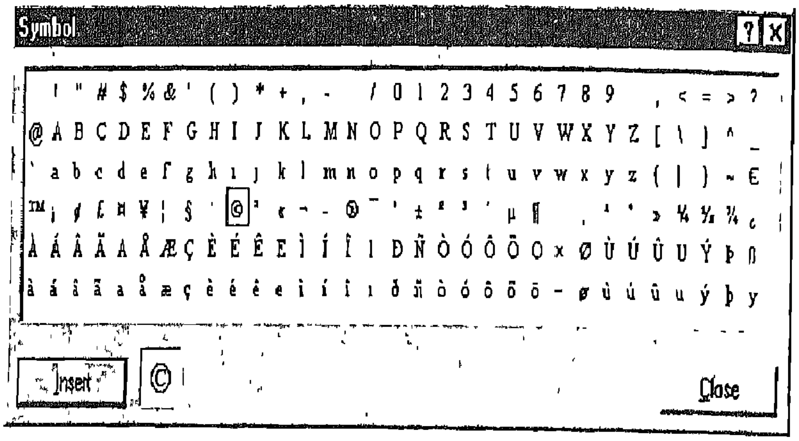
The lines are automatically shaded to give the illusion of depth Check the Solid line box to make the line all one color and set a Color for the line if necessary (not supported by Netscape)



- Click OK when finished

Symbols

Add unique symbols such as the copyright (©) and accented letters (é) from the Symbol dialog box Select **Insert|Symbol** from the menu bar Click the symbol on the list you want to add and it will appear in the preview window Click the Insert button to add the symbol to the page Keep adding symbols and click Close when finished.

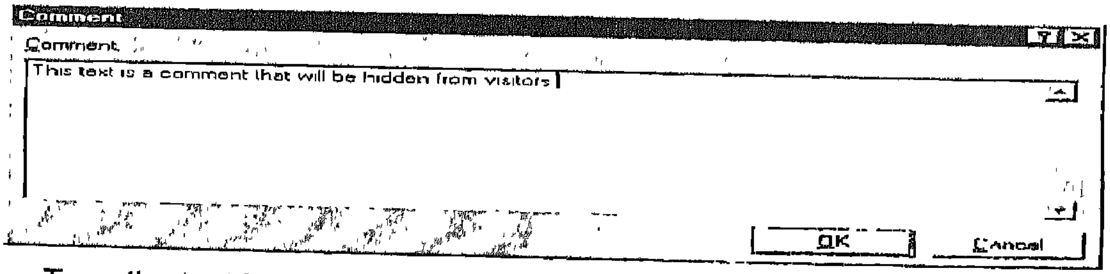


Comments

Text can be hidden from visitors to your web page and still be visible to you when the page is edited in FrontPage. These comments can be added by following these steps.

Place the cursor on the page at the location where the comment will be added.

- Select **Insert|Comment** from the menu bar.



This text is a comment that will be hidden from visitors

- Type the text in the Comment box and click OK.
- Notice that the commented text begins with "Comment: " and is another color to differentiate it from regular text. Open the page in a browser to see that the commented text is not visible on the page

Keyboard shortcuts

Keyboard shortcuts can save time and the effort of constantly switching from the keyboard to the mouse to execute simple commands. Print this list of FrontPage keyboard shortcuts and keep it by your computer for a quick reference.

Note: A plus sign indicates that the keys need to be pressed at the same time.

Action	Keystroke

Document actions	
Open a page	CTRL+O
New page	CTRL+N
Save	CTRL+S
Print	CTRL+P
Properties	ALT+ENTER
Refresh	F5
Spelling	F7
Thesaurus	SHIFT+F7
Line break	SHIFT+ENTER
Remove formatting	CTRL+Spacebar

Editing	
Find	CTRL+F
Replace	CTRL+H
Insert hyperlink	CTRL+K
Spell checker	F7
Macros	ALT+F8

Action	Keystroke

Formatting	
Select all	CTRL+A
Copy	CTRL+C
Cut	CTRL+X
Paste	CTRL+V
Undo	CTRL+Z
Redo	CTRL+Y
Bold	CTRL+B
Italics	CTRL+I
Left justified	CTRL+L
Center justified	CTRL+E
Right justified	CTRL+R
Decrease indent	CTRL+SHIFT+M
Increase indent	CTRL+M

Web Design Tips

- **Background Images**: Use background images with caution Light watermarks usually work fine, but dark, busy graphics can impair the readability of the page. Solid, muted colors are usually best to use.

- **Fonts**: Stick with common fonts such as Arial and Times New Roman. Although there are many fonts to choose from, if the user does not have a font you choose on their computer, a default font will be used.

- **Long Pages**: Divide the information into different pages. A long and endless scrolling page is difficult to read

- **Sound**· Refrain from using sound, particularly embedded sound files, if possible. If a sound file must be included, make it a link on the page so the visitor to your page can turn it on and off. Many people surf the web with their computer speakers turned off so embedding a sound file that automatically downloads will unnecessarily increase the download time of the page

- **Hyperlinks**· Always use descriptive words for link text instead of the simple "Click Here!" For example:

  Incorrect - This site includes tutorials for using programs in the Microsoft Office suite To view the Microsoft Office 2000 tutorials, click here.

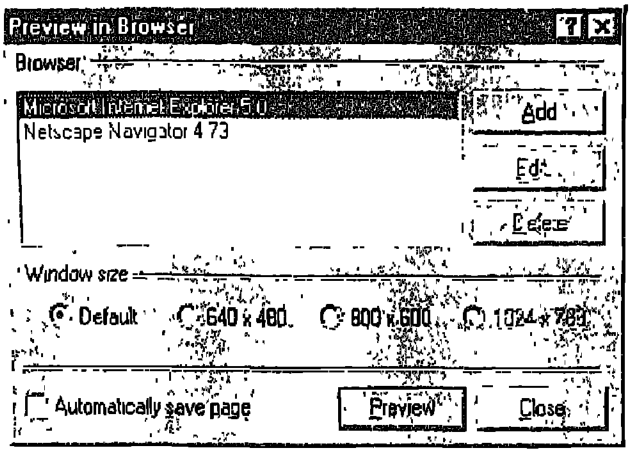
  Correct - To learn more about using the programs of the Microsoft Office suite, visit the Microsoft Office 2000 tutorial homepage.

- **Page Size**· While most Internet users use a screen resolution of 800X600 or higher, there are still users with monitors set to 640X480 Design your web pages so all material is viewable on this small resolution. Therefore, do not create graphics or tables wider than 620 pixels.

Testing

Since different browsers (mainly Microsoft Internet Explorer and Netscape Navigator) read web page differently, preview your pages in both browsers to make sure the page looks the way you want it. FrontPage provides an easy way to accomplish this.

- Select **File|Preview** in Browser from the menu bar.



- The list of browsers installed on your computer will be listed Highlight the browser name and click Preview for each browser.

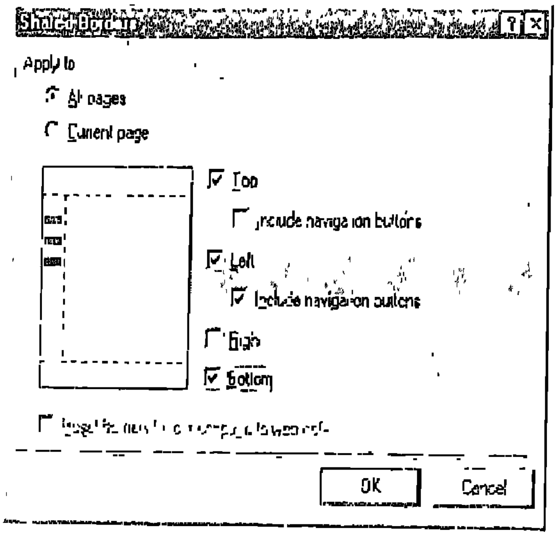
Shared Borders

Shared Borders are parts of the web page that share content with the other pages in the web. They are located at the top, bottom, left side, or right side of the page and are useful for information that should appear on every page in the web such as navigation links, web site headers, and copyright information.

Adding Shared Borders

Add shared borders to a web by following these steps:

- Open a web and select **Format|Shared Borders** .. from the menu bar



Shared Borders

Apply to

● All pages

○ Current page

☑ Top

☐ Include navigation buttons

☑ Left

☑ Include navigation buttons

☐ Right

☑ Bottom

☐ [illegible]

- Check All pages to apply the border(s) to every page in the web or Current page if the border(s) should appear only on the current page
- Select the areas where the shared borders should appear by checking the Top, Left, Right, and Bottom boxes. It is not recommended to have content for the Right border since it may not be visible to users with low screen resolutions.
- Check the Include navigation buttons boxes if those sections will have site navigation elements (explained in detail on the next page).
- Click OK when finished These properties can be changed by selecting **Format|Shared Borders...** again from the menu bar after the shared borders have been defined

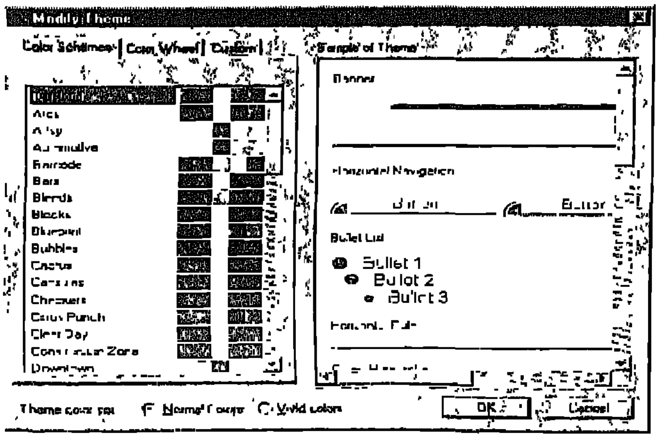
Edit content by clicking on the shared border and replacing purple comment text with text and graphics.

Colors

Click the Colors... button to modify the color scheme.

- Color Schemes tab - Select preset color schemes from the list and preview those colors in the theme in the Sample of Theme window.

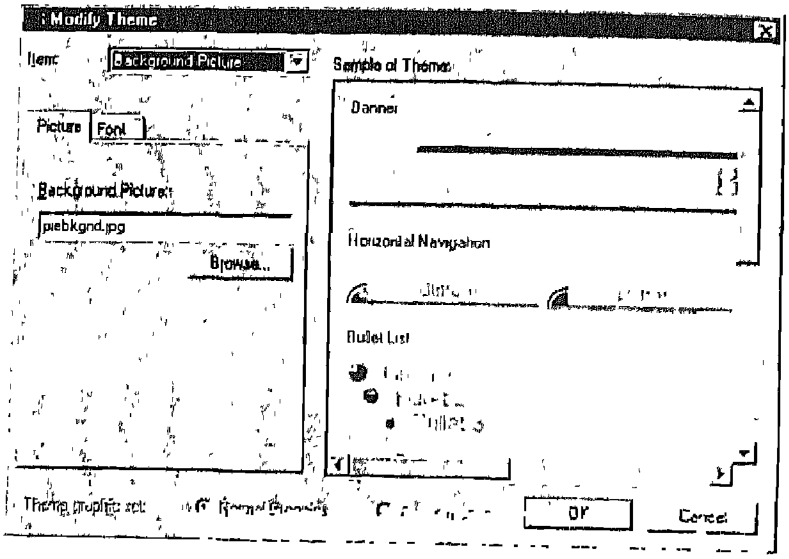
- Color Wheel tab - Click and drag the circle in the color wheel to alter the color scheme. Use the Brightness slider to brighten and dim the colors.
- Custom tab - Change each text type individually by selecting the item from the drop-down menu and assigning a color.
- Click OK when you are finished modifying the color scheme.



Graphics

The bullets, banners, and backgrounds on a theme can be changed as well. Click the Graphics. . button to change the images in the theme.

- Select items from the drop-down menu Change the images from the text field provided under the Picture tab and modify the fonts used from the Font tab.
- At the bottom of the window, select "Normal Graphics" for static images and "Active Graphics" for Java rollover applets
- Click OK when finished.



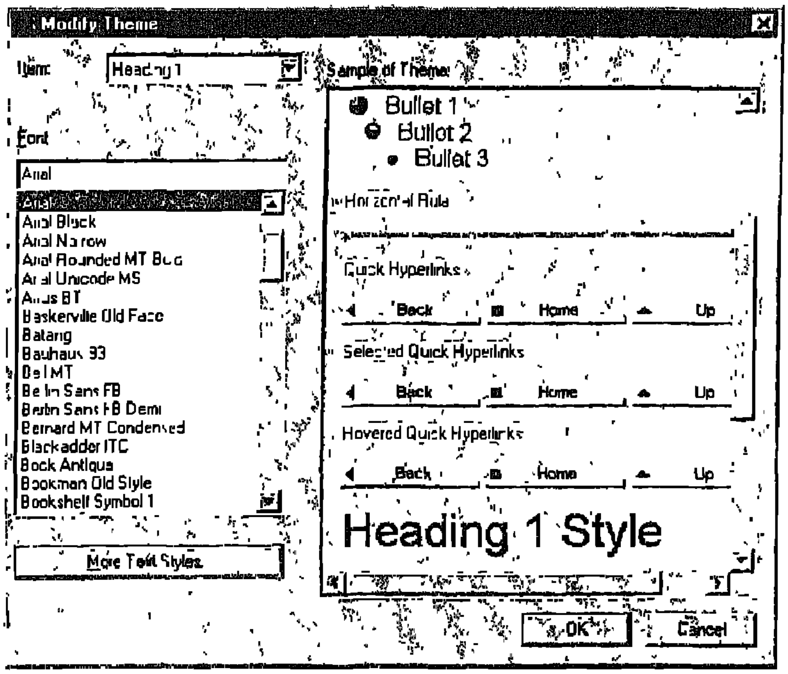
Item: Background Picture

Background Picture: piebkgnd.jpg

Text

The Text .. button will provide a menu that will allow you to change the font of elements in the theme

- Select a text element from the Item drop-down menu and then select the new font for the item from the Font list
- Click the More Text Styles... button to change additional text properties



Item: Heading 1

Font: Arial

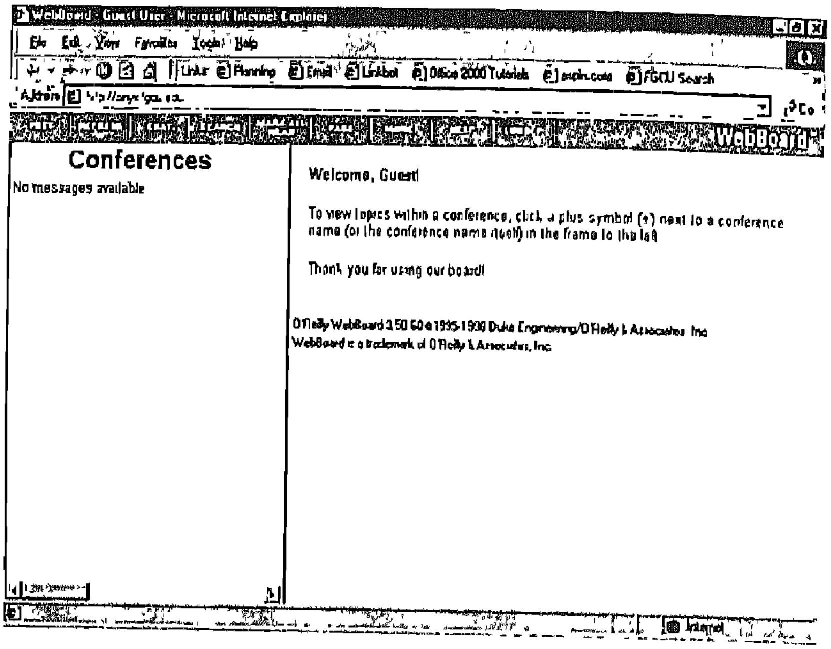
Saving a Modified Theme

If you plan on using the same modified theme on other pages, the theme can be saved. Click the Save As button on the Themes dialog box and enter a name for the theme.

Frames

What Are Frames?

Frames divide a web page into sections that each has a different HTML source page and their own set of scroll bars. They can be useful for any site that requires part of the screen to remain static while the remainder of the screen can be scrolled. One example is site navigation where links can be placed in one frame and the scrolling page content is placed in another. There are several disadvantages to using frames including slower download time and problems with linking and printing so be sure to use them only if necessary.


WebBoard - Guest User - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Links Planning Email Linkbot Office 2000 Tutorials FGCU Search
Address
Go
WebBoard
Internet

Conferences

No messages available

Welcome, Guest!

To view topics within a conference, click a plus symbol (+) next to a conference name (or the conference name itself) in the frame to the left

Thank you for using our board!

O'Reilly WebBoard 3.50.60 © 1995-1999 Duke Engineering/O'Reilly & Associates Inc
WebBoard is a trademark of O'Reilly & Associates, Inc.

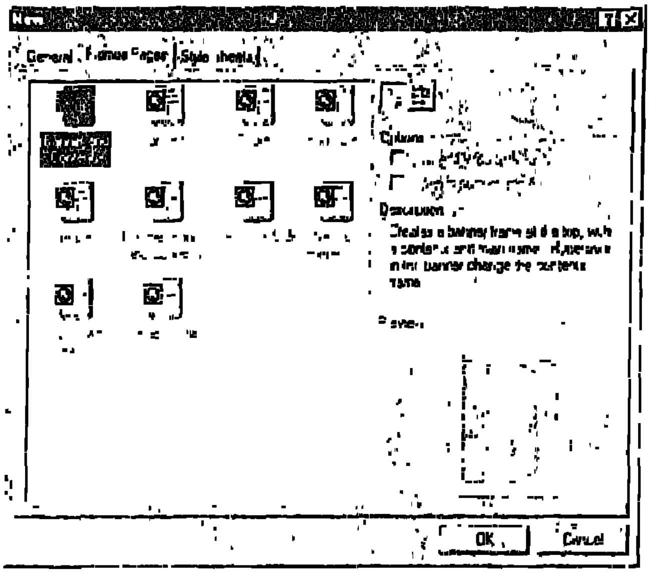
Create a Frames Page

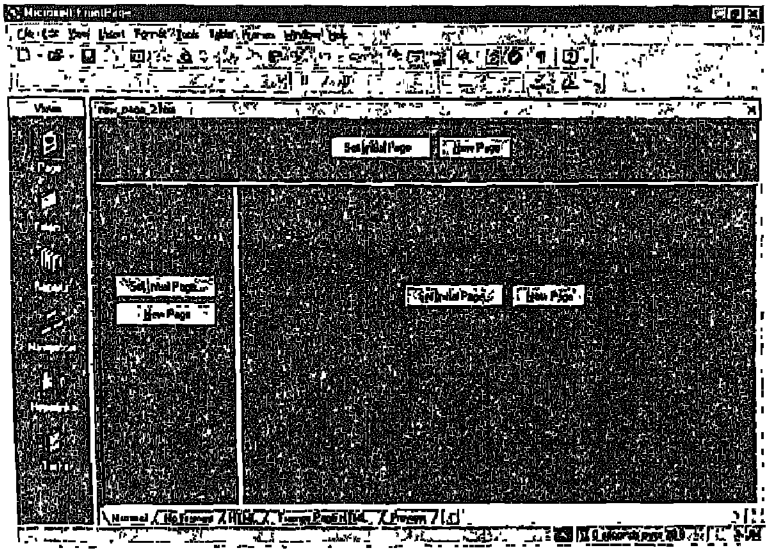
Create a frames page by following these steps:

- Select **File|New|Page** from the menu bar and click the Frames Pages tab.

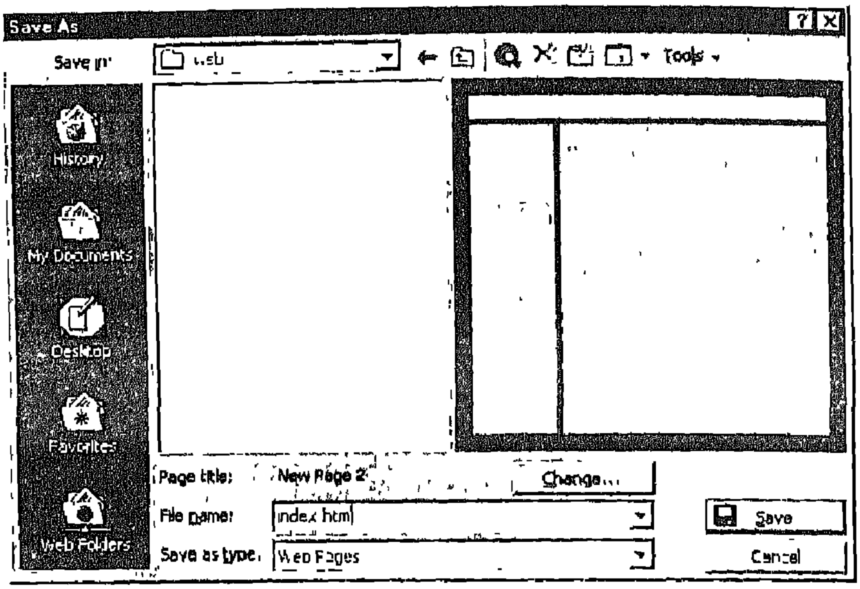
- Preview each of the choices by clicking on an icon once with the mouse and seeing the Preview window. Select the icon of the frames format you would like to use and click OK.

When viewed in Page view, the web page will be divided into frames and each frame will have "Set Initial Page..." and "New Page" buttons Click New Page if the source page for the frame does not yet exist The frame will immediately turn white after the button is clicked and you will be able to type and add graphics just like a normal web page Click Set Initial Page if the source page for the frame has already been created and select the file from the dialog box





- Save the frames pages by selecting **Files|Save** As from the menu bar. It is required to save the main frame page first followed by each of the frame source pages. The diagram will highlight the page you are saving. Below, the diagram highlights all of the frames in blue, indicating that the main frame page is being saved:



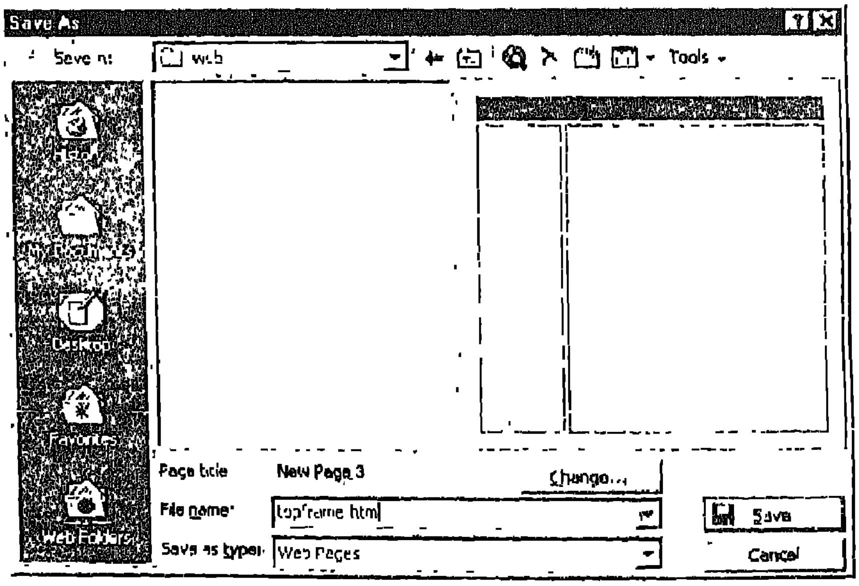
Save in: web

Page title: New Page 2

File name: index.htm

Save as type: Web Pages

- In the image below, the source of the top frame is being saved:



Save in: web

Page title: New Page 3

File name: topframe.htm

Save as type: Web Pages

Frame Properties

Right-click on a frame either before or after its content page has been identified and select Frame Properties from the shortcut menu.

Name
Assign a name to each frame for linking purposes.

Initial Page
Assign the initial HTML source page.

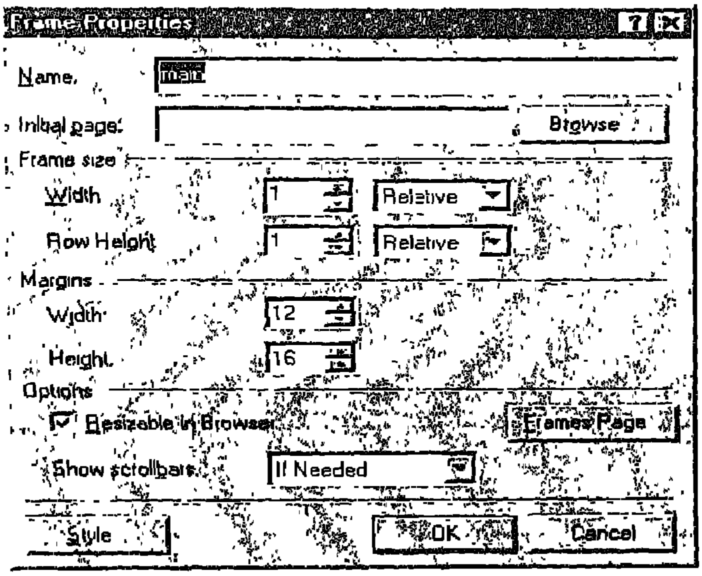
Frame size

Designate the width and height of the frame in absolute pixels or as a percentage of the screen.

Options
Check "Resizeable in Browser" if the user should be able to click and drag the frame border to resize them. Make a selection from "Show scroll bars" if scroll bars should be visible in th frame.

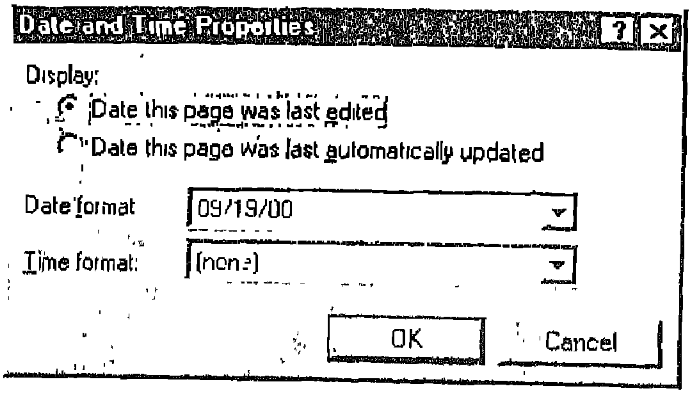
Linking in Frames

When creating a link from a frames page, click the pencil button next to the Target fram option on the Create Hyperlink dialog box.


Frame Properties
Name: main
Initial page:
Frame size
Width: 1 Relative
Row Height: 1 Relative
Margins
Width: 12
Height: 16
Options
☑ Resizeable in Browser
Show scrollbars: If Needed

Date and Time

It is always advantageous to include a "last updated" date on the bottom of the web page so visitors know how recent the material is. FrontPage can automatically update this date whenever the page is saved. Place the cursor on the page where the date should appear and select **Insert|Date and Time** . from the menu bar. If the page is set up to automatically update and this date should be reflected as the "last update", check the "Date this page was last automatically updated" box Select a Date format and if the time should also appear, select the Time format. Click OK when finished.



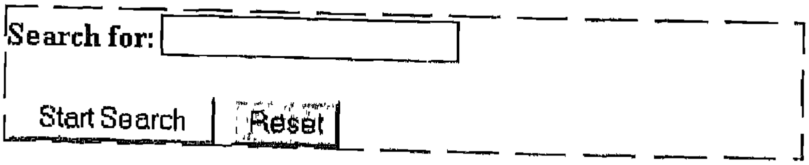
● Date this page was last edited
○ Date this page was last automatically updated

Date format: 09/19/00

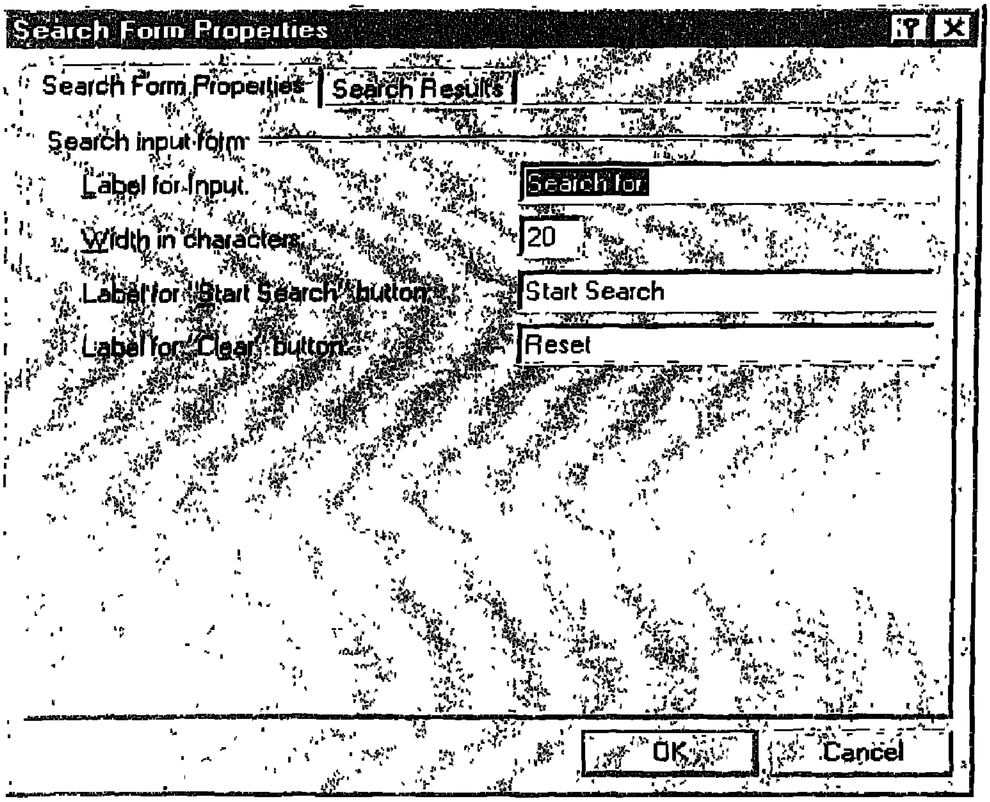
Time format: (none)

Search Form

Add a search form to the web site by selecting **Insert|Component|Search Form** from the menu bar. This feature will automatically create a simple search form:



Customize the search form from the properties window.



Search input form

Label for Input: Search for

Width in characters: 20

Label for "Start Search" button: Start Search

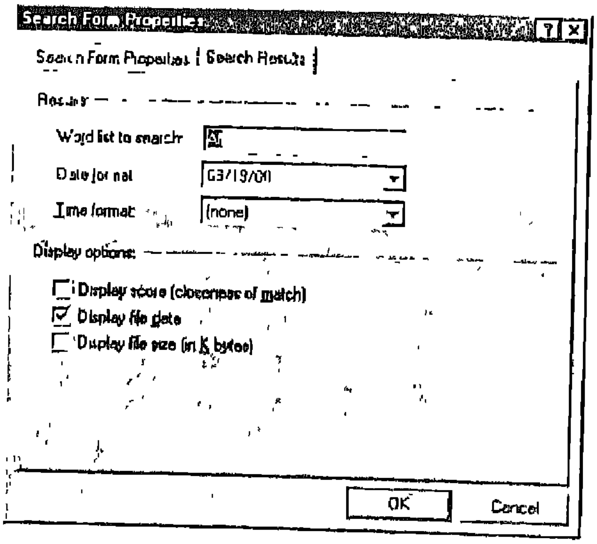
Label for "Clear" button: Reset

Label for Input is the text that appears before the search text box

Width in characters is the width of the search text box

Labels for "Start Search" and "Clear" buttons the text that appear on the buttons

Click the Search Results tab to format the search results page.



Results

Word list to search: All

Date format: 03/19/01

Time format: (none)

Display options:

☐ Display score (closeness of match)

☑ Display file date

☐ Display file size (in K bytes)

Select the date and time format for displaying the results.

Display score is the closeness of the keywords entered to the page that was found. A higher score indicates a closer match.

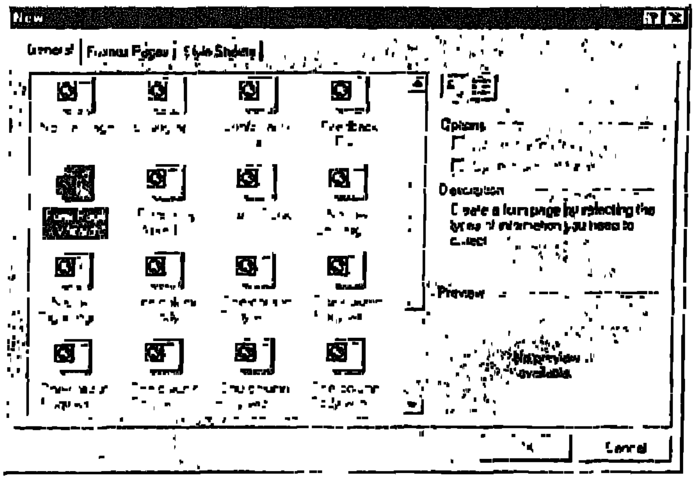
Display file date includes the date the page was last modified

Display file size prints the size of the page in kilobytes

Forms

Form Page Wizard

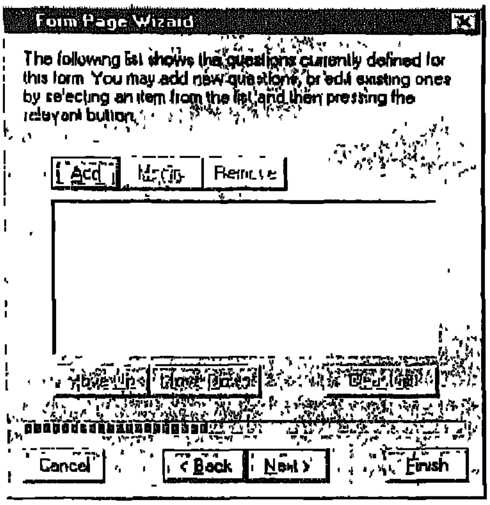
Forms allow you to receive information from the visitors to your web site. The forms can be created manually or by FrontPage's Form Page Wizard. To use the wizard, select File|New|Page from the menu bar



Create a form page by selecting the types of information you need to collect

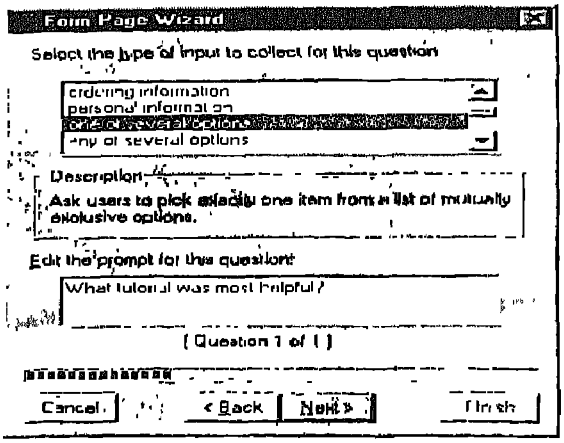
- Click Next > on the first explanatory wizard window.

✓ The second window will allow you to add the questions that will appear on the form Click the Add button to insert new questions into the form.



The following list shows the questions currently defined for this form. You may add new questions, or edit existing ones by selecting an item from the list, and then pressing the relevant button.

✓ Select an input type from the scrolling menu and edit the prompt for the question in the text box below if necessary. Click Next > when finished.



Select the type of input to collect for this question

ordering information
personal information
one of several options
any of several options

Description

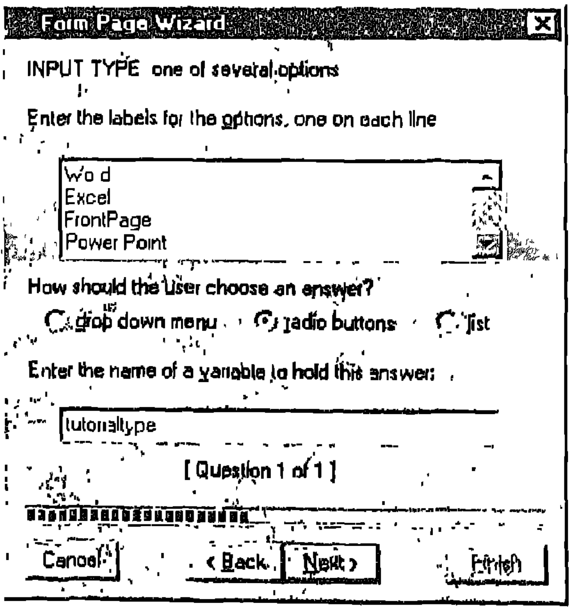
Ask users to pick exactly one item from a list of mutually exclusive options.

Edit the prompt for this question:

What tutorial was most helpful?

[Question 1 of 1]

✓ Select the input type for the question you entered in the previous window. The contents of this window will vary depending on the type of question that was entered. Click Next > when the selections have been made.



INPUT TYPE one of several options

Enter the labels for the options, one on each line

Word
Excel
FrontPage
Power Point

How should the user choose an answer?

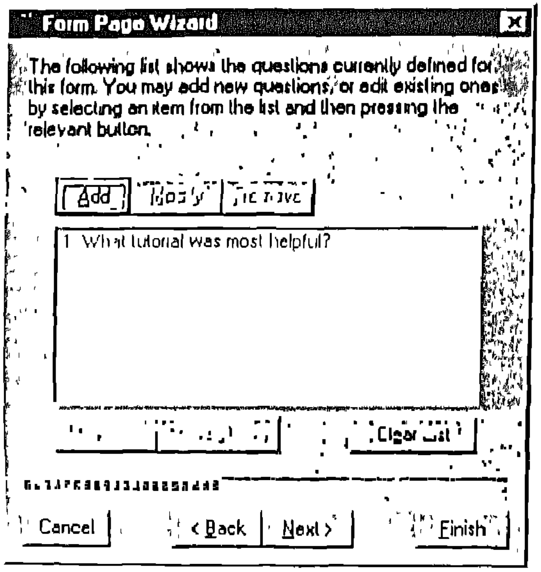
○ drop down menu ● radio buttons ○ list

Enter the name of a variable to hold this answer:

tutorialtype

[Question 1 of 1]

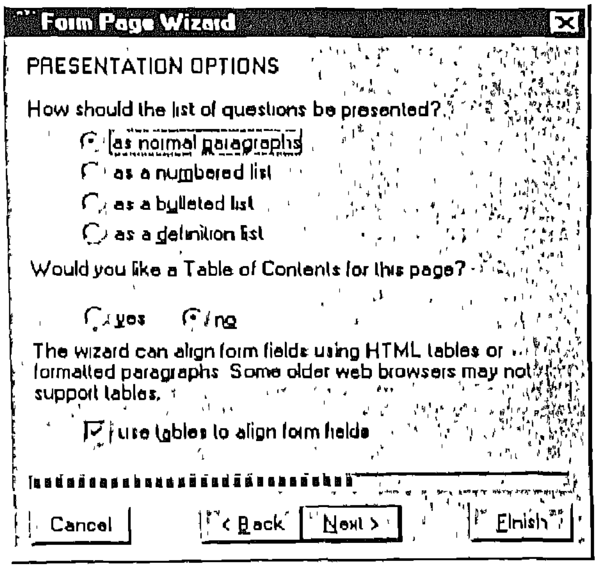
The question will now appear in the question listing. Click Add to add more elements to the form If a question should be changed, highlight the title in the list and click Modify or Remove to delete the question. Reorder the questions using the Move Up and Move Down buttons. Click Next > to proceed to the next step after the questions have been added



The following list shows the questions currently defined for this form. You may add new questions, or edit existing ones by selecting an item from the list and then pressing the relevant button.

1 What tutorial was most helpful?

- **Presentation Options** - On this window, determine the layout of the form from several options and click Next >.



PRESENTATION OPTIONS

How should the list of questions be presented?

● as normal paragraphs
○ as a numbered list
○ as a bulleted list
○ as a definition list

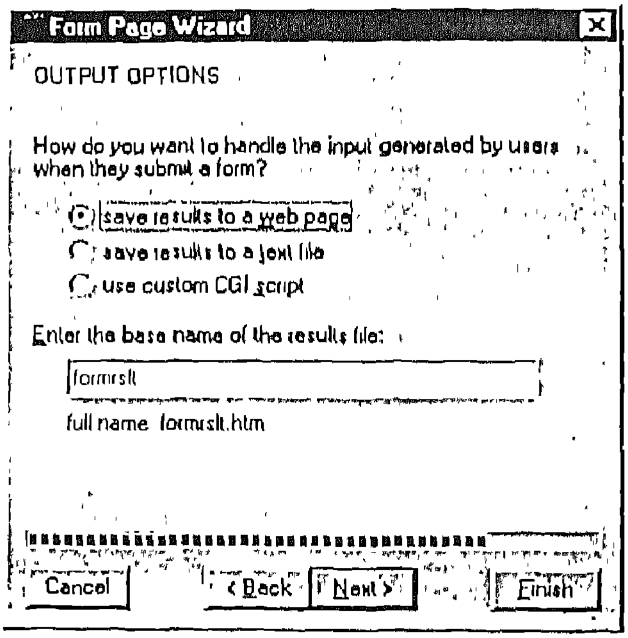
Would you like a Table of Contents for this page?

○ yes ● no

The wizard can align form fields using HTML tables or formatted paragraphs. Some older web browsers may not support tables.

☑ use tables to align form fields

- **Output Options** - Now that the form elements are in place, you need to designate a way to view the results of the form. You will want to save them either as a web page or text file and enter the base name for the file where results will be stored Click Next > when finished



How do you want to handle the input generated by users when they submit a form?

● save results to a web page
○ save results to a text file
○ use custom CGI script

Enter the base name of the results file:

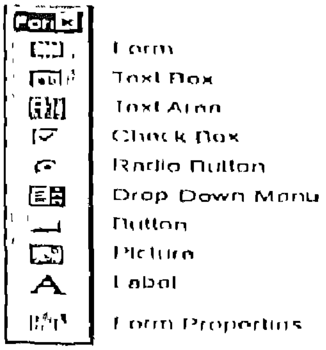
formrslt

full name formrslt.htm

- The form is now complete. Click Finish to add the form to the web page.

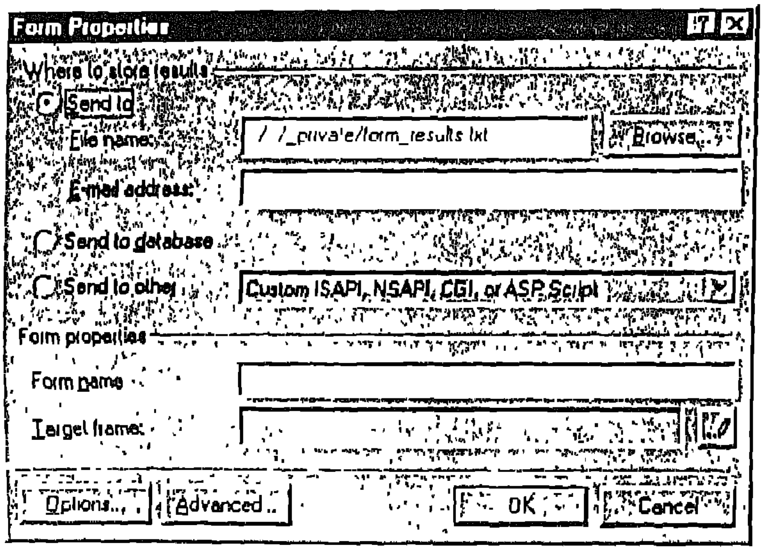
Forms Toolbar

Activate the Form toolbar by selecting Insert|Form and dragging the menu off the menu bar



First, click the Form button. A dotted area with Submit and Reset buttons inside will appear.

Click the Form Properties button.



Where to store results

● Send to

File name: /_private/form_results.txt

E-mail address:

○ Send to database

○ Send to other: Custom ISAPI, NSAPI, CGI, or ASP Script

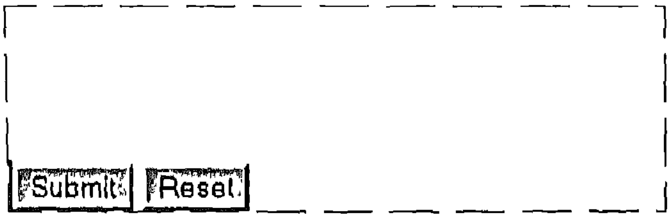
Form properties

Form name:

Target frame:

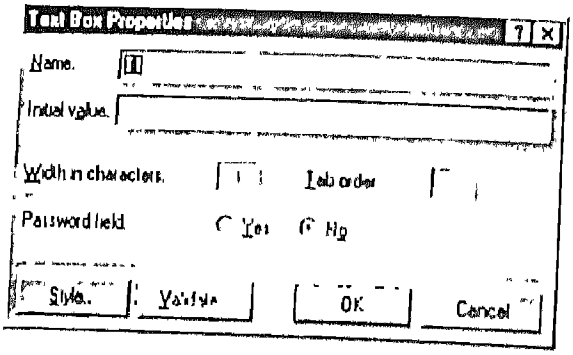
Select the storage location for the form contents and name the form after Form name. Click Options... to specify text results page options, e-mail options and a confirmation page.

On the form, place the cursor before the Submit button and press the ENTER key several times to add room in the form above the existing buttons.



Text Box [ab]

Text boxes allow the user to enter one line of text Click the button on the form toolbar to add a text box to the form. Activate the text box and select Format|Properties from the menu bar.



Password field ○ Yes ● No

Name - Enter a name for the text box with no spaces.

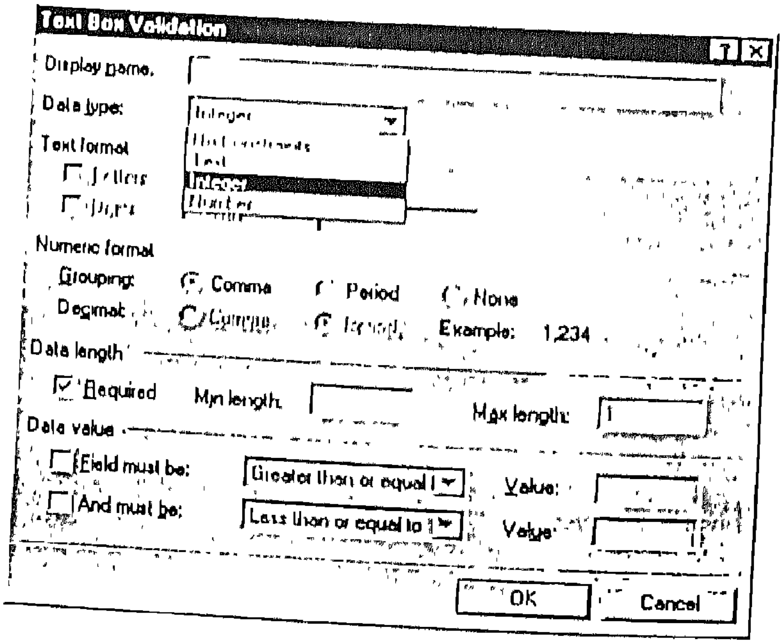
Initial Value - This text will initially appear in the text box.

Width in characters - Determines the width of the text box. The width can also be changed by clicking and dragging the handles on the element

Tab order - It will be easiest to set the tab order when all the form elements are on the page Use numbers 1,2,3.. to determine the order the user will encounter each form element when the TAB key is used

Password field - Select Yes if the entry into the text box should be treated as a password and asterisks will be used as the text is typed.

Validate .. - Click this button to enter optional validation criteria.



Data type: Integer (list: No Constraints, Text, Integer, Number)

Grouping: ● Comma ○ Period ○ None

Decimal: ○ Comma ● Period Example: 1,234

☑ Required Max length: 1

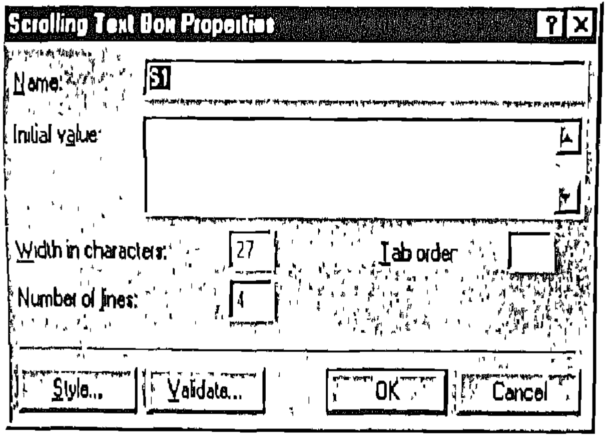
☐ Field must be: Greater than or equal to Value:

☐ And must be: Less than or equal to Value:

Set the text box to only accept a certain data type, a minimum or maximum length, and other options.

Text Area

Text boxes allow the user to enter multiple lines of text Click the button on the form toolbar to add a text area to the form. Activate the text area and select **Format|Properties** from the menu bar



Name: S1

Initial value:

Width in characters: 27

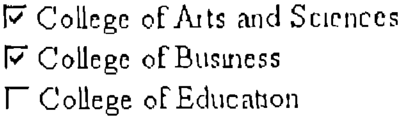
Tab order:

Number of lines: 4

Set these properties just as in a text box. The width and number of lines in the text area can also be changed by clicking and dragging the handles of the text area.

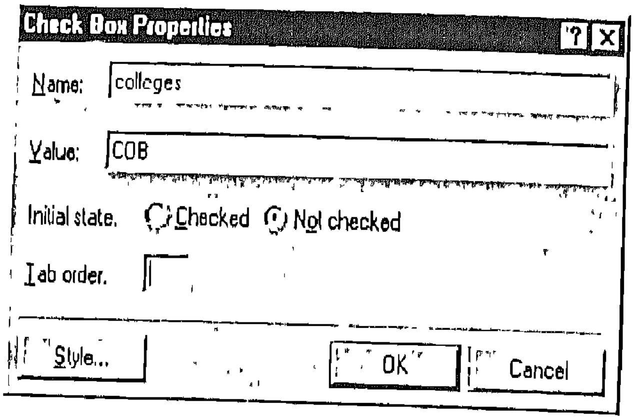
Check Box

Check boxes allow the user to make multiple selections from a list. Add check boxes by clicking the button on the form toolbar, enter value, and press ENTER or SHIFT+ENTER after each one.



☑ College of Arts and Sciences
☑ College of Business
☐ College of Education

Select **Format|Properties** to change the checkbox properties



Name: colleges

Value: COB

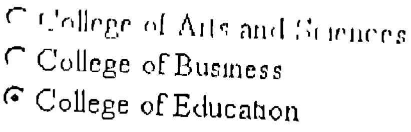
Initial state: ○ Checked ● Not checked

Tab order:

Name - All checkboxes in the same list should be given the same name In the example above, the three checkboxes all have the name "colleges"
Value - The values of each checkbox must be different "COB" is being used as the value for the "College of Business" checkbox
Initial state - If it is likely that the user will check a certain checkbox, the box can be set to be checked initially

Radio Button

Radio buttons allow the user to make only a single selection from a list. Add a list of radio buttons by clicking the button on the form toolbar, enter value, and press ENTER or SHIFT+ENTER after each one



○ College of Arts and Sciences
○ College of Business
● College of Education

Select **Format|Properties** to change the radio button properties These properties are similar to those for checkboxes.

Drop-Down Menu

If a check box or radio button is too long, a better choice may be a drop-down menu. The menu will consolidate the choices and take up less vertical space on the page. Add a drop-down menu to the form by clicking its button

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